Vol. 1017 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

April 27, 1982

U.S.
DEPARTMENT
OF COMMERCE

Patent
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PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

April 27, 1982 Volume 1017 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Fees	
Basic Fee (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation Fees	65.00

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of Mar. 1982

Affirmed	254
Affirmed in Part	36
Reversed	64
Total	354

Subscription Pricing Information

The annual subscription prices on the following publications have been changed, as indicated below:

Title: Official Gazette, Trademark Section

Domestic mailing	$205.00
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This change is effective with Government Periodicals and Subscription Services Price List 36, dated Spring, 1982.

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THERESA A. BRELSFORD,
Mar. 26, 1982. *Acting Assistant Commissioner for Administration.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,028,433, Re. S.N. 320,929, Filed Nov. 13, 1981, Cl. 525/67, THERMOPLASTIC MOULDING COMPOUNDS, Richard Prinz, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Arthur G. Connolly, et al., Ex. Gp.: 143

4,145,818, Re. S.N. 353,020, Filed Mar. 1, 1982, Cl. 34/10, METHOD AND APPARATUS FOR REMOVING A VAPORIZED LIQUID FROM A GAS, FOR USE IN E.G. A PROCESS BASED ON THE FLUIDIZED BED PRINCIPLE, Hanspeter Kulling, Owner of Record: *Aeromatic AG, Muttenz, Switzerland,* Attorney or Agent: Lawrence I. Lerner, et al., Ex. Gp.: 344

4,191,139, Re. S.N. 352,726, Filed Feb. 23, 1982, Cl. 123/48A, ENGINE WITH SECONDARY PISTONS, Vincent J. Tompkins, Owner of Record: *Inventor,* Attorney or Agent: Curtis Ailes, Ex. Gp.: 342

4,191,231, Re. S.N. 354,416, Filed Mar. 3, 1982, Cl. 150/8, FLEXIBLE COLLAPSIBLE CONTAINERS AND METHOD OF MOLDING, David A. Winchell, et al., Owner of Record: *Baxter Travenol Laboratories, Inc., Deerfield, Ill.,* Attorney or Agent: Garrettson Ellis, et al., Ex. Gp.: 241

4,203,255, Re. S.N. 351,137, Filed Feb. 22, 1982, Cl. 49/399, FIRE-RESISTANT COMPOSITE WOOD STRUCTURE PARTICULARLY ADAPTED FOR USE IN FIRE DOORS, Edwin N. Naslund, et al., Owner of Record: *Cal-Wood Door, Santa Rosa, Calif.,* Attorney or Agent: Karl A. Limbach, et al., Ex. Gp.: 352

4,243,699, Re. S.N. 335,162, Filed Dec. 28, 1981, Cl. 427/183, METHOD OF POWDER COATING THE INSIDE OF PIPES WITH A CONTINUOUS FILM OF PLASTIC MATERIAL, Jack, E. Gibson, Owner of Record: *GCB, Inc., Odessa, Tex.,* Attorney or Agent: D. Carl Richards, et al., Ex. Gp.: 162

4,245,730, Re. S.N. 351,465, Filed Feb. 23, 1982, Cl. 194/1A, DISPLAY PANEL FOR A VENDING MACHINE, G. Merle Bachmann, et al., Owner of Record: *The Coca-Cola Co., Atlanta, Ga.,* Attorney or Agent: Terrell C. Birch, et al., Ex. Gp.: 311

4,249,482, Re. S.N. 354,666, Filed Mar. 4, 1982, Cl. 119/17, AIR CONDITIONED LABORATORY RACK FOR ANIMAL CAGES, James R. Harr, Owner of Record: *Inventor,* Attorney or Agent: Philip K. Fitzsimmons, Ex. Gp.: 333

4,273,685, Re. S.N. 353,774, Filed Mar. 1, 1982, Cl. 260/28.5, RUBBER MODIFIED ASPHALT COMPOSITIONS, Alfred Marzocchi, et al., Owner of Record: *Ownes-Corning Fiberglas Corp., Toledo, Ohio,* Attorney or Agent: Ronald C. Hudgens, et al., Ex. Gp.: 142

4,282,202, Re. S.N. 345,474, Filed Feb. 3, 1982, Cl. 424/23, INTRAMAMMARY COMPOSITIONS, John Sidney Dowrick, Owner of Record: *Beecham Group Ltd., Brentford, Middlesex, England,* Attorney or Agent: Albert L. Jacobs, Jr., Ex. Gp.: 125

4,286,120, Re. S.N. 321,344, Filed Nov. 13, 1981, Cl. 179/90, CURRENT REGULATED PULSE DIALER CIRCUIT, John D. Sublette, Owner of Record: *GTE Automatic Electric Laboratories, Inc., Northlake, Ill.,* Attorney or Agent: Gregory G. Hendricks, Ex. Gp.: 235

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,271,149, Reexam. No. 90/000,179, Requested: Mar. 26, 1982, Cl. 424/150, GERMICIDAL IODINE COMPOSITIONS WITH ENHANCED IODINE STABILITY, Murray W. Winicov, et al., Owner of Record: *West Agro-Chemical, Inc., Westwood, Kans.,* Attorney or Agent: Howard E. Thompson, Ex. Gp.: 120, Requester: Nicholas J. Aquilino, Arlington, Va.

4,296,581, Reexam. No. 90/000,178, Requested: Mar. 24, 1982, Cl. 52/520, ROOFING STRUCTURE, Robert E. Heckelsberg, Owner of Record: *AMCA International Corp., Hanover, N.H.,* Attorney or Agent: Harness, Dickey & Pierce, Ex. Gp.: 354, Requester: Butler Manufacturing Co., Research Center, Grandview, Mo.

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

SN 6-108,260. SAMPLE MOUNT FOR X-RAY DIFFRACTION. Patent 4,278,883 issued July 14, 1981 by the Dept. of Interior.

SN 6-136,126. SLIDEBOARD DEVICE FOR UNDERGROUND MINE FACE VENTILATION. Patent 4,282,802 issued Aug. 11, 1981 by the Dept. of Interior.

SN 6-168,822. PROCESS OF ELECTROPLATING A PLATINUM-RHODIUM ALLOY COATING. Patent 4,285,784 issued Aug. 25, 1981 by the Dept. of Interior.

SN 6-186,090. RECOVERY OF BISMUTH FROM CHLORIDE PROCESS SOLUTIONS. Patent 4,285,912 issued Aug. 25, 1981 by the Dept. of Interior.

SN 6-116,697. RECOVERY OF LITHIUM FROM LOW-GRADE ORES. Patent 4,285,914 issued Aug. 25, 1981 by the Dept. of Interior.

SN 6-162,542. HIGH SURFACE AREA TRANSITION METAL CATALYSTS AND METHOD OF PREPARING SAME. Patent 4,287,095 issued Sept. 1, 1981 by the Dept. of Interior.

SN 6-184,852. SPUTTERING APPARATUS FOR COATING ELONGATED TUBES AND STRIPS. Patent 4,290,877 issued Sept. 22, 1981 by the Dept. of Interior.

SN 6-211,556. CHROMATOGRAPHY DEVELOPING CHAMBER. Filed Dec. 1, 1980. Patent 4,306,977 issued Dec. 22, 1981 by Dept. of Interior.

SN 6-114,536. MOUNTING BLOCK TO ROTATE COAL CUTTER BITS. Filed Feb. 2, 1980. Patent 4,302,053 issued Nov. 24, 1981 by Dept. of Interior.

SN 6-275,033. ANTIVIRAL ACTIVITIES OF DANSYL-CADAVERINE & CLOSELY RELATED COMPOUNDS. Filed June 18, 1981 by Dept. of Health & Human Services.

SN 6-296,239. FIBER OPTIC PROBE FOR TISSUE MEASUREMENTS. Filed Aug. 25, 1981 by Dept. of Health & Human Services.

SN 6-321,689. THE USE OF CONTEXT TO SIMPLIFY TWO-DIMENSIONAL COMPUTER INPUT. Filed Nov. 16, 1981 by Dept. of Health & Human Services.

SN 6-324,464. MODULAR SCIENTILLATION CAMERA. Filed Nov. 24, 1981 by the Dept. of Health & Human Services.

SN 817,887. AUGER CONSTRUCTION PROVIDING REDUCED NOISE. Patent 4,266,830 issued May 12, 1981 by the Dept. of the Interior.

SN 968,046. AUTOMATIC FEED AND ROTATIONAL SPEED CONTROL SYSTEM OF A HYDRAULIC MOTOR OPERATED DRILL. Patent 4,271,914 issued June 9, 1981 by the Dept. of Interior.

SN 6-114,522. METAL HYDRIDE ACTUATION DEVICE. Patent 4,282,931 issued Aug. 11, 1981 by the Dept. of Interior.

SN 81,505. PASSIVE EXPLOSION BARRIER FOR MINES. Patent 4,284,144 issued Aug. 18, 1981 by the Dept. of Interior.

SN 6-268,592. OPEN SURFACE FLOTATION METHOD FOR EXTRACTED CRUDE OIL. Filed May 29, 1981 by the Dept. of Interior.

SN 6-285,247. POWER SUPPLY FOR AN INTRINSICALLY SAFE CIRCUIT. Filed July 21, 1981 by the Dept. of Interior.

SN 6-300,834. RECOVERY OF CHROMIUM FROM WASTE. Filed Sept. 10, 1981 by Dept. of Interior.

SN 6-237,617. PRODRUG DERIVATIVES OF 9-B-D-ARABINOFURANOSYL-2-FLUOROADENINE. Filed Feb. 24, 1981. Dept. of Health and Human Services.

SN 6-165,336. METHOD FOR PRODUCING TRIPDIOLIDE TRIPTOLIDE AND CELASTROL. Filed July 2, 1980. Dept. of Health and Human Services.

SN 6-310,406. B-KETOCARBOXYL AND PHOSPHONATE DIHYDROCHALCONE SWEETENERS. Filed Oct. 9, 1981. Dept. of Health and Human Services.

SN 6-314,477. VITRO CELLULAR INTERACTION WITH AMNION MEMBRANE SUBSTRATE. Filed Oct. 23, 1981. Dept. of Health and Human Services.

SN 6-300,363. FREQUENCY STABILIZATION FOR TWO-MODE LASER. Filed Sept. 8, 1981. Department of Commerce.

SN 6-329,870. A NON-TRANSFORMED THYMIDINE KINASELESS CELL LINE AND ITS USE FOR TESTING TUMORIGENIC POTENTIAL OF GENES. Filed Dec. 11, 1981. Dept. of Health and Human Services.

SN 6-321,689. THE USE OF CONTEXT TO SIMPLIFY TWO-DIMENSIONAL COMPUTER INPUT. Filed Nov. 16, 1981. Dept. of Health and Human Services.

SN 6-118,959. TRIANGULAR SHAPED CUTTING HEAD FOR USE WITH A LONGWALL MINING MACHINE. Filed Feb. 6, 1980. Patent 4,303,277 Issued Dec. 1, 1981 by Dept. of Interior.

SN 6-147,690. METHOD FOR MEASURING THE IONIC ACTIVITIES IN WATER WITH A DIFFERENTIAL PRESSURE TRANSDUCER. Patent 4,301,676 issued Nov. 24, 1981 by Dept. of Interior.

SN 6-310,584. APPARATUS FOR SPLITTING FLUID SAMPLES INTO A PLURALITY OF REPRESENTATIVE SUB-SAMPLES. Filed Oct. 13, 1981 by Dept. of the Interior.

SN 6-311,487. FROTH FLOTATION OF RUTILE. Filed Oct. 15, 1981 by the Dept. of Interior.

SN 6-317,652. APPARATUS FOR LIFTING A FLEXIBLE CABLE. Filed Nov. 2, 1981 by Dept. of Interior.

SN 6-319,862. ANTI-INCENTIVE COAL CUTTER BITS. Filed Nov. 9,1981 by Dept. of Interior.

Status of PTO Services

The following is an update of the status of PTO services as of Apr. 2, 1982:

Service Item	FY 1982 Performance Goal (Calendar Days)	Actual	Comment
Internal Mail Processing & Delivery	4	4	
Filing Receipts:			
Patents	22	92	No Comment
Trademarks	30	29	
Patent Copies:			
Window Coupons	5	48% within 5 days 99% within 30 days	Delays associated with new contractor start-up on Mar. 1. Significant improvement noted each week.
Mail Coupons	15	75% within 15 days 99% within 30 days	
Letter Orders*	20	95% within 20 days 99% within 30 days	
Certified Copies:			
Trademark Regs.	30	29	Reflects a 5 day reduction since last month.
All other	Being established	90% within 15 days 97% within 30 days	
Trademark Search Room:			
Filing Drawings	21	18	
Filing Reg. Certificates	3	3	
Patent Assignments	15	53	Backlog due to unavailable funding.
Trademark Assignments	21	95	Backlog due to unavailable funding.
Patent Official Gazette	Issue Date	On Schedule	
Patent Grants	Issue Date	On Schedule	
Trademark Official Gazette	Issue Date	On Schedule	
Trademark Registrations	Issue Date	On Schedule	

*Figures exclude mail processing and delivery time.

Apr. 2, 1982.

THERESA A. BRELSFORD,
Acting Assistant Commissioner for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Apr. 27, 1982

Re. 30,791	4,284,573	4,301,119	4,308,467
3,985,539	4,285,868	4,301,295	4,310,865
4,000,165	4,287,177	4,301,327	4,310,903
4,005,093	4,289,827	4,301,516	4,310,910
4,017,334	4,290,400	4,301,889	4,311,041
4,079,353	4,290,475	4,302,123	4,311,607
4,181,791	4,291,403	4,302,222	4,311,641
4,185,325	4,291,780	4,302,229	4,311,899
4,223,233	4,292,324	4,302,460	4,312,877
4,227,135	4,292,422	4,302,809	4,314,049
4,229,740	4,293,235	4,302,921	4,314,115
4,231,312	4,293,950	4,303,164	4,314,255
4,237,424	4,294,139	4,303,359	4,314,456
4,237,957	4,294,941	4,303,881	4,314,466
4,249,558	4,295,573	4,304,238	4,314,546
4,263,006	4,295,639	4,304,766	4,315,028
4,264,482	4,296,428	4,305,385	4,315,731
4,265,252	4,296,797	4,305,396	4,316,089
4,268,872	4,297,829	4,307,127	4,316,398
4,270,953	4,298,251	4,307,343	4,316,668
4,271,509	4,298,466	4,307,572	4,317,417
4,272,592	4,298,563	4,307,940	4,317,581
4,276,098	4,299,317	4,308,063	4,317,604
4,277,760	4,299,819	4,308,101	
4,281,379	4,299,891	4,308,112	
4,284,070	4,301,037	4,308,119	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF March 20, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-23-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-04-80
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-04-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-02-81
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-22-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	6-18-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	7-09-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-28-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	5-12-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-18-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-28-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	5-06-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	5-30-80

Expiration of patents: The patents within the range of numbers indicated below expire during March 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,171,131 to 3,176,313, inclusive

Plant Patents ..... Numbers 2,486 to 2,489 inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,912

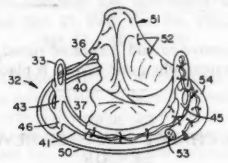
STENT FOR HEART VALVE

Warren D. Hancock, Newport Beach, Calif., assignor to Hancock Laboratories, Inc., Anaheim, Calif.

Original No. 3,570,014, dated Mar. 16, 1971, Ser. No. 759,858, Sep. 16, 1968. Application for reissue Jun. 14, 1978, Ser. No. 915,451

Int. Cl.³ A61F *1/22*

U.S. Cl. 3—1.5 **15 Claims**



35. A stent for [a] *an animal* heart valve *for supporting such a heart valve in its natural contour* comprising

a framework of annular configuration,

said framework including *three* spaced apical portions *at one end thereof* and arms interconnecting said apical portions,

for thereby providing an attachment for the commissures and cusps of a heart valve, *said arms being in two sets spaced apart axially, one of said sets being adjacent said apical portions and the other of said sets being remote from said apical portions, said arms in at least the one of said sets adjacent said apical portions being curved in a scalloped configuration so as to incline away from said apical portions intermediate said apical portions for conforming to the shape of and supporting the margins of the cusps of an animal heart valve such that the peripheral parts of said heart valve can be attached to said arms while preserving the natural contour of said heart valve,*

each of said apical portions being rounded *convexly as viewed from said one end,* and having a substantial circumferential dimension for permitting said apical portions to accommodate heart valves of different dimensions, said apical portions being annular and of generally oval shape.

Re. 30,913

SAFETY RAZOR WITH FLEXIBLE BLADE CARTRIDGE

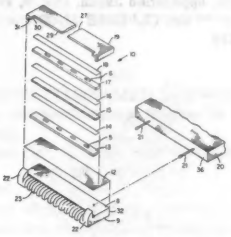
Cyril A. Cartwright, Monroe; James S. Emmett, Ansonia; Arthur E. Michael, Middletown; Anthony J. Peleckis, Fairfield, and Ernest M. Symes, Guilford, all of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Original No. 4,069,580, dated Jan. 24, 1978, Ser. No. 715,272, Aug. 18, 1976. Application for reissue Jan. 17, 1980, Ser. No. 112,757

Int. Cl.³ B26B *21/14*

U.S. Cl. 30—47 **30 Claims**

1. A razor assembly comprising a blade assembly including a seat member and a blade disposed thereon, the seat and blade being bonded together and flexible about an axis substantially parallel to the plane of the blade and perpendicular to its cutting edge, a razor handle for holding the blade assembly, and coupling means for connecting the blade assembly to the razor handle and permitting the blade assembly to flex [in both



convex and concave directions] *selectively in the convex or concave mode* in response to shaving forces.

Re. 30,914

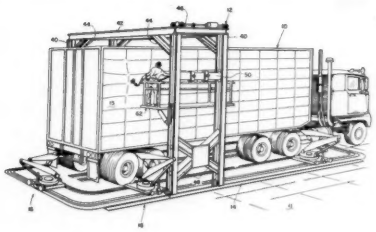
TRUCK FRAME ALIGNMENT APPARATUS

Finis L. Chisum, P.O. Box 1145, Claremore, Okla. 74017

Original No. 4,138,876, dated Feb. 13, 1979, Ser. No. 710,437, Aug. 2, 1976. Application for reissue Dec. 5, 1979, Ser. No. 100,440

Int. Cl.³ B21D *1/14*

U.S. Cl. 72—457 **12 Claims**



10. The hydraulic crane of claim 1 further including:

a second set of tracks which at least partially surround the frame upon which said object can be positioned;

an inverted U-shaped second frame having a pair of spaced vertical columns forming each arm of said inverted U, and cross beams across the top of said two pairs of spaced columns, forming a rigid rectangular second frame;

roller means on the bottom of said four columns to roll said frame along said second tracks, and means to lock said columns to said second tracks;

a vertically movable platform, supportive of a person thereon, attached to said spaced columns between the columns and said object; and

means vertically movable upon said spaced columns for applying a force of selected magnitude and direction to the object.

Re. 30,915

APERTURE INTERLOCKING DEVICE FOR A SINGLE LENS REFLEX CAMERA OF THE INTERCHANGEABLE VIEWFINDER TYPE

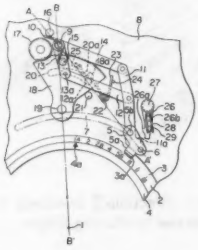
Sunao Ishizaka, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Original No. 4,085,416, dated Apr. 18, 1978, Ser. No. 749,047, Dec. 9, 1976. Application for reissue Apr. 14, 1980, Ser. No. 139,780

Claims priority, application Japan, Dec. 9, 1975, 50-150586

Int. Cl.³ G03B *13/02*

U.S. Cl. 354—219 **9 Claims**



7. A picture-taking lens for use in a camera body which includes an engaging member (5) biased to a specific position for receiving aperture information from said picture-taking lens, said picture-taking lens comprising:

a fixed index mark (4a); and

an aperture ring (2) rotatable about the optical axis of said picture-taking lens and having thereon an aperture scale and an outwardly projected and circumferentially extending engaging portion (3), the engaging portion having a wider range than the entire range of said aperture scale, one shoulder (3a) of said engaging portion being engageable with said engaging member of said camera body to transmit the aperture information of said picture-taking lens to said camera body when said picture-taking lens is mounted to said camera body.

Re. 30,916

WAND TURN-ON CONTROL

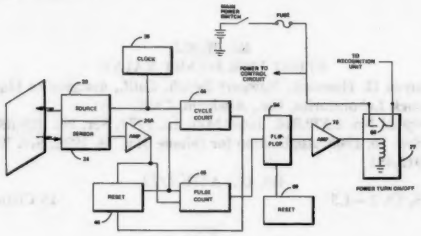
Lynn McWaters, Garland, Tex., assignor to Recognition Equipment Incorporated, Irving, Tex.

Original No. 4,072,859, dated Feb. 7, 1978, Ser. No. 729,531, Oct. 4, 1976. Application for reissue Jan. 28, 1980, Ser. No. 116,181

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—214 R **11 Claims**

1. A control circuit for conserving power in a battery powered system comprising: a sensing means for determining when the system is placed into use and for generating pulses indicative of said use, a clock circuit for generating clock pulses, a counting circuit for counting pulses generated by said sensing means and clock and for generating a signal when said counting circuit counts to a predetermined state, and a power con-



trol circuit responsive to said generated signal for controlling power to said system when said system is placed into use.

Re. 30,917

TWO-PHASE CHARGE TRANSFER DEVICE IMAGE SENSOR

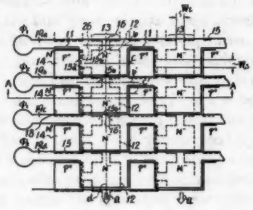
Yoshiaki Hagiwara, and Hiroshi Yamazaki, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Original No. 4,064,524, dated Dec. 20, 1977, Ser. No. 703,792, Jul. 9, 1976. Application for reissue Dec. 17, 1979, Ser. No. 104,270

Claims priority, application Japan, Jul. 31, 1975, 50-93746

Int. Cl.³ H01L *29/78, 27/14, 31/00;* **G11C** *19/28*

U.S. Cl. 357—24 **10 Claims**



8. A two phase charge transfer device comprising a semiconductor substrate, an insulation layer of uniform thickness formed on said substrate, a shift register having a plurality of cells formed in said substrate, an input to said shift register and an output to said shift register between which charges flow, a plurality of aligned electrodes formed over said cells on said insulation layer, each of said cells being associated with a respective electrode, and means for applying two phase clock signals to said aligned electrodes to form potential wells in said cells and to shift said charges, each of said cells comprising a transfer region and a storage region, a transfer region of a cell being located between a storage region of said cell and said input, each of said cells formed of said transfer and storage regions of said substrate having a first conductivity type, and channel stopper regions having a second conductivity type so as to maintain charge carriers in said transfer and storage regions, with the regions of said substrate forming said storage regions being defined by regions of said first conductivity type bordered in a direction transverse to the charge flow direction by channel stopper regions of said second conductivity type, and said transfer regions being defined by regions of said first conductivity type which are narrower in said transverse direction than said regions of first conductivity type in said storage regions and said regions of said first conductivity type in said transfer regions being bordered in said transverse direction by channel stopper regions of said second conductivity type to form asymmetrical potential wells in said cells, the minimum potential in a storage region of a cell being deeper than that in a transfer region of said cell.

PLANT PATENTS

GRANTED APRIL 27, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,841

CLIMBING CARIBIA

Fred Mungia, Sr., P.O. Box 338, McFarland, Calif. 93250

Filed Oct. 17, 1980, Ser. No. 198,243

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—2 **1 Claim**

1. A new and distinct variety of rose plant of the climbing hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by its general similarity to its parent variety, "Caribia", synonym "Harry Wheatcroft" (U.S. Plant Pat. No. 3,623), but different therefrom by its pronounced climbing growth habit.

4,842

POINSETTIA NAMED TOPWHITE

Peter Jacobsen, Skibby, Denmark, assignor to Paul Ecke, Jr., Encinitas, Calif.

Filed Oct. 17, 1980, Ser. No. 197,951

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct poinsetta cultivar, substantially as herein shown and described, characterized particularly by the whiter and cleaner color of its bracts and its retention of the advantageous physical and growing characteristics of its red parent variety.

PATENTS

GRANTED APR. 27, 1982

ERRATA

For CLASS	See PATENT NO.
441–005	4,326,312
200–047	4,326,627
340–594	4,326,780
376–216	4,326,917
376–272	4,326,918
376–267	4,326,919
376–205	4,326,920
376–353	4,326,921
376–435	4,326,922
524–261	4,326,999
524–285	4,327,000
524–322	4,327,001
524–114	4,327,002
523–336	4,327,003
524–745	4,327,004
524–377	4,327,005
524–315	4,327,006
524–315	4,327,007
524–104	4,327,008
524–114	4,327,009
524–388	4,327,010
524–474	4,327,011
523–203	4,327,012
524–538	4,327,013
523–116	4,327,014
524–162	4,327,015
524–180	4,327,016
156–069	4,327,147
373–009	4,327,241
322–003	4,327,337
372–089	4,327,338

PATENTS

GRANTED APR. 27, 1971

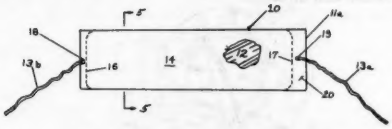
TREATY

PATENTS

GRANTED APRIL 27, 1982

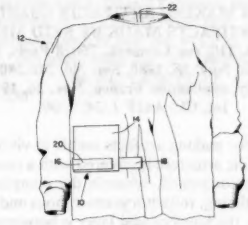
GENERAL AND MECHANICAL

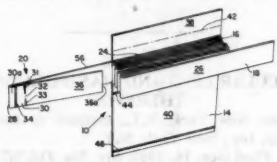
4,326,299
SOCCER CUFF
Robert M. Bednar, 8506 Goldfinch Way, West Chester, Ohio 45069
Filed May 12, 1980, Ser. No. 149,038
Int. Cl.[3] A41D *13/00*
U.S. Cl. 2—22 **8 Claims**



1. A soccer coff comprising:
a. An elongate member, at least a portion of which comprises a pad of resilient foam-like material;
b. fastening means proximate opposite ends of said elongate member; and
c. an elastic cuff, whereby said elongate member is attached around a wearer's ankle by said fastening means and said cuff is snugly juxtaposed around and covering said elongate member to provide protection from blows to the ankle, achilles tendon and foot of the wearer.

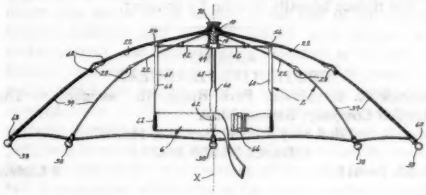
4,326,300
BELT PACKAGE WITH TEMPORARILY SECURED DETACHABLE BELT END
Deborah A. Bolton, Memphis, Tenn., and Jean E. Schaefer, Cincinnati, Ohio, assignors to The Buckeye Cellulose Corporation, Cincinnati, Ohio
Filed Jun. 4, 1979, Ser. No. 45,157
Int. Cl.[2] A41F *9/00*; A41D *13/12*
U.S. Cl. 2—114 **10 Claims**





1. In a belt package for a surgical gown, a belt having a belt end extending from a belt support, the extremity of said belt end being defined by a transverse region of weakness and separable from the balance of the belt therealong, said belt end being doubled by folding it back on itself along a fold line extending transversely across the balance of the belt in a position adjacent but spaced from said region of weakness, the doubled portion being folded inwardly to position said extremity, the region of weakness and the distal end of the balance of the belt over an outer face of said belt package and underlying an adjacent portion of the belt end, said distal end being detachably secured to said outer face of said belt package.

4,326,301
COLLAPSIBLE SUNSHADE
Louis C. Brock, 13468 Forest Lac, St. Louis County, Mo. 63141
Filed May 27, 1977, Ser. No. 801,151
Int. Cl.[3] A42B *1/20*; A45B *11/04*
U.S. Cl. 2—177 **11 Claims**

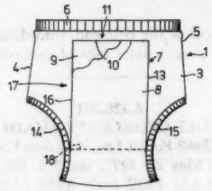


1. A headgear comprising: a frame including a hub having a center axis, a plurality of ribs pivotally connected to the hub, an actuating element aligned with the hub and movable toward and away from the hub along the center axis, and a plurality of struts interposed between and pivotally connected to the actuating element and the ribs, the length of the struts being such that when the actuating element is moved to a position against the hub the ribs will be in an erected position in which they radiate from the hub, but when the actuating element is moved to a spaced position away from the hub, the ribs and struts will assume a collapsed position in which they extend generally in the same direction as the center axis and lie along the center axis slightly outwardly therefrom, with the struts being located inwardly from the ribs; legs pivotally connected at their upper ends to the frame in alignment with at least some of the struts and extending downwardly away from their respective struts when the ribs and struts are in their erected position, the legs extending generally in the same direction as and being located between their respective struts and ribs when the ribs and struts are in their collapsed position, the legs further having inwardly opening channels which receive the struts when the struts and ribs are in their collapsed position; and a headband connected to the legs at their lower ends.

4,326,302
UNDERPANTS
David R. Lowe, Brinscall, and Gerard J. Hay, Chorley, both of England, assignors to Courtaulds Limited, London, England
Filed Aug. 10, 1979, Ser. No. 65,739
Claims priority, application United Kingdom, Aug. 25, 1978, 34702/78
Int. Cl.[3] A41B *9/02*
U.S. Cl. 2—405 **3 Claims**

1. Underpants suitable for use by male persons comprising:
(a) material configured to provide a waist opening and a pair of leg openings including a front panel terminating in a free lower edge in the genital area; and
(b) an externally located elongate pouch secured to said front panel, comprising an inner panel of a liquid-permeable material and an outer panel of a liquid-impermeable material, and being provided with an opening for insertion of a fluid-absorbing pad, said pouch partially overlying the front panel and extending over and below said free lower edge into the crotch region; and

(c) a fly opening between the front panel and a side portion of the pouch overlying said front panel, whereby exit for



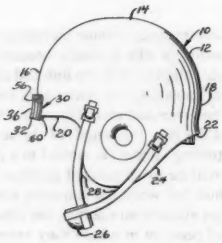
normal micturition is provided under said free lower edge and thence laterally out the fly opening.

4,326,303

PROTECTIVE HEADGEAR

Frederick A. Rappleyea, Park Ridge, Ill., assignor to The Kendall Company, Boston, Mass.

Filed May 5, 1980, Ser. No. 146,957
Int. Cl.³ A42B 3/82
U.S. Cl. 2—411 **9 Claims**



1. Protective headgear, comprising:

a relatively rigid shell for covering the wearer's head, said shell having an outer surface, and an inner surface facing toward the wearer's head; and

a bumper for the shell comprising, a flexible cover attached to a front of the shell adjacent a lower front edge of the shell, said cover having a recess facing the front surface of the shell, and including a flange extending from a lower portion of the cover around the lower front edge of the shell, said flange having an upwardly directed inner lip engaging the inner surface of the shell in an area only adjacent the edge of the shell, with said area extending continuously from the edge of the shell in a direction upwardly from the edge, and a pad of high energy attenuation material received in said recess intermediate the cover and shell and extending over only the outer surface of the shell.

4,326,304

HEART VALVE WITH PIVOTED OCCLUDER

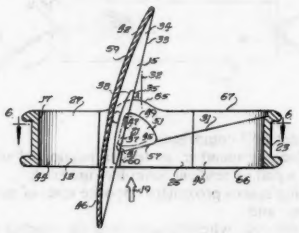
Jerome J. Klawitter, New Orleans, La., assignor to Hemex, Inc., Austin, Tex.

Filed Sep. 17, 1980, Ser. No. 182,869
Int. Cl.³ A61F 1/22
U.S. Cl. 3—1.5 **7 Claims**

1. A heart valve prosthesis comprising:

an annular valve body having a generally circular central passageway therethrough with a pair of central opposed planar sections designed to permit the flow of blood therethrough in a predetermined downstream direction and having a pair of opposed pie-shaped depressions recessed in said planar sections and each having an upstream vertex distal to the centerline of said body, an upstream straight edge, a downstream straight edge and an arcuate edge connecting said straight edges;

a single occluder having a pair of ears which extend outward from a pair of flat sides into said depressions whereby said occluder is mounted for substantially pivotal movement along an eccentric pivot axis defined by the rotation of said ears relative to said vertices of said depressions, which pivot axis divides said occluder and said valve body into major and minor portions, said single occluder being pivotable between a closed position to block blood flow through said central passageway, and an open position allowing blood flow therethrough in said predetermined downstream direction;



said occluder having a concave-convex configuration and a generally elliptical periphery and being mounted in said annular valve body with its pivotal axis parallel to its minor elliptical axis and with the concave surface facing upstream;

and a lip projecting into said passageway from said major portion of said valve body having a downstream-facing surface along which said occluder seats in said closed position and which is oriented at an angle of between about 75° and about 85° to the centerline of said valve body.

4,326,305

METHOD FOR MAKING ARTIFACTS USABLE IN VIVO AND A ARTIFACTS MADE BY SAID METHOD

Jean P. Davidas, 110, rue Lamarck, 75018 Paris, France

Filed Nov. 26, 1980, Ser. No. 210,380
Claims priority, application France, Nov. 26, 1979, 79 29038
Int. Cl.³ A61F 1/24, 1/00
U.S. Cl. 3—1.9 **5 Claims**

1. A method for making artifacts usable in vivo, of the type in which a metallic armature is covered with a coating layer of a biocompatible compound, wherein the compound forming said layer is insulating, refractory, amorphous and non porous, and wherein the thickness of said layer is between 100 A° and 0.5 micron.

4,326,306

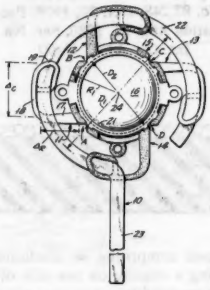
INTRAOCULAR LENS AND MANIPULATING TOOL THEREFOR

Stanley Poler, New York, N.Y., assignor to Lynell Medical Technology, Inc., New York, N.Y.

Filed Dec. 16, 1980, Ser. No. 216,787
Int. Cl.³ A61F 1/16, 1/24
U.S. Cl. 3—13 **14 Claims**

1. In combination, a manipulable tool for substantially flat shipping support for an intraocular lens-and-mount assembly wherein a lens having a circular periphery is circumferentially retained, the mount of said assembly including flexibly compliant apertured iris-stabilizing feet projecting radially outward of plural angularly spaced regions of the lens-retaining circumference of said assembly, said tool comprising a generally hook-shaped end and a shank end integrally connected and with substantially constant cross-section, the apertures of said

feet being of open section to clear said substantially constant cross-section and being assembled in circumferential succession to said tool, the span of said hook-shaped end being such as to accommodate assembly to all said feet at angularly spaced locations with the lens of said mount assembly centrally positioned within said hook-shaped end and with said feet in essentially flat unstressed condition, for generally central stabilized retention of the lens during storage and/or shipment, the effective compliantly achievable length of said feet exceeding the radius of circumferential retention of the lens, whereby upon



lifting said tool, said lens and the circumferentially retaining portion of said mount become compliantly suspended beneath said hook-shaped end and said feet may be manipulated into clustered relation at the shank end of said tool, for cluster-grouped insertion of said feet into an excavated lens sac in the course of posterior-chamber implantation of the lens, so that said tool may be withdrawn to release said feet within the sac for compliant stabilizing conformance with sac inner-wall contouring to retain the lens anterior to said feet and in the posterior chamber.

4,326,307

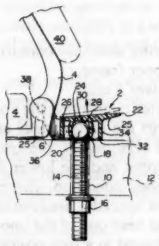
RELEASABLE TOILET SEAT CLAMP

Kenneth D. Baillie, and J. Donald Lafontan, both of 840 W. 64th Ave., Vancouver, B.C., Canada (V6P 2L4)

Continuation-in-part of Ser. No. 911,970, Jun. 2, 1978, abandoned. This application Jan. 22, 1980, Ser. No. 114,259

Int. Cl.³ A47K *13/12*

U.S. Cl. 4—236 **6 Claims**



1. A clamp for detachably securing a toilet seat to a toilet bowl having spaced vertical holes in the flanged portion of the rear of the upper part of the bowl, the clamp comprising a first member consisting of a spherically headed bolt and nut means to secure the bolt in seated engagement within one of the vertical holes so that the spherical head of the bolt extends out beyond the upper part of the bowl, and a second, fastener member to be associated with the toilet seat to engage the bolt, the fastener member having a smooth top circumscribed by downwardly depending sides, the lower edges of the sides to rest in contact with the upper part of the bowl when the fastener is in engagement with the bolt to impart rigidity and stability to the clamp, the lower surface of the top of the fastener member further provided with a downwardly depending centrally disposed circular wall forming a socket, the downwardly depending circular wall is essentially rigid and provided with a plurality of notches piercing the wall and extending axially from the lower edge thereof, whereby the walls are provided with sufficient reesiliency to enable snapping the head of the bolt into engagement in the socket, or removal of the bolt therefrom, the head of the bolt and the socket of the fastener member being contoured for mating engagement for releasably securing the bolt and fastener member against unpurposeful disengagement; the fastener member being further provided with finger grip means to assist in intentional disengagement of the fastener means from the head of the bolt, the finger grip means being located at the rear of the top of the fastener member and laterally spaced with respect to the socket thereof, and comprising an extension of the top of the fastener member beyond the rear side thereof to provide a lip under which the fingers may be inserted for application of upward force to that portion of the fastener member, and wherein the bolt is further provided with a flange of circular periphery secured to the bolt immediately below its head, this flange to rest on the upper surface of the toilet bowl when the bolt is in position within one of the vertical holes through the flanged portion of the rear of the upper part of the bowl.

4,326,308

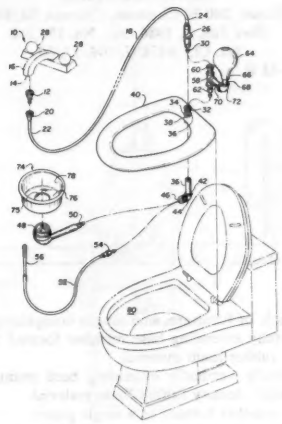
HYGIENIC DEVICE PROVIDING SITZ BATH, SHOWER, AND DOUCHE

Louis Silver, 5825 Collins Ave., Miami Beach, Fla. 33140

Continuation-in-part of Ser. No. 33,456, Apr. 26, 1979, Pat. No. 4,287,618. This application Apr. 18, 1980, Ser. No. 141,374

Int. Cl.³ A61H *35/00*; B05B *1/16*

U.S. Cl. 4—420.3 **4 Claims**



1. An apparatus useful for treatment of ailments of the perirectal area, comprising,

a conventional toilet bowl,

a toilet seat removably mounted in operable relation to said toilet bowl,

said removably mounted toilet seat being provided in lieu of the conventional hingedly mounted toilet seat, which conventional toilet seat is placed in its open position when the removably mounted seat is in use,

said removably mounted toilet seat provided with a substantially vertically aligned aperture than extends completely therethrough,

a first conduit member extending through said aperture so

that the uppermost end of said conduit member is disposed upwardly of the plane defined by said removably mounted toilet seat and so that its lowermost end is disposed downwardly of said plane,

a first elongate, flexible hose member having its opposed ends adapted for respective releasable engagement with a conventional spigot and the uppermost end of said conduit member so that fluid under pressure is carried by said hose from said spigot to said conduit,

a flow control valve disposed in the end of said flexible hose adjacent said conduit so that flow of fluid through said hose can be throttled by the user of the apparatus when such user is seated upon said apparatus,

a second elongate, flexible hose member having its opposed ends respectively adapted for releasable engagement with the lowermost end of said first conduit member and with a douche implement

means for releasably connecting a shower head member to the lowermost end of said first conduit member, in lieu of said second hose member and said douche implement, so that said shower head member is disposed in cantilevered relation to said lowermost end of said first conduit member,

a basin member having an apertured bottom wall through which the operative portion of said shower head member extends, said shower head member being the sole means of supporting said basin member,

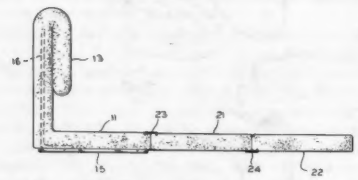
said basin member having its rim disposed in substantially coplanar relation to said removably mounted toilet seat, so that a static size bath treatment is provided when said basin member is filled with fluid and so that a dynamic size bath treatment is provided when said basin member is filled with fluid and said shower head member is discharging fluid from said source of fluid under pressure.

4,326,309

BEDDING DEVICE

Dennis M. Flaum, 260 E. Chestnut, Chicago, Ill. 60610

Filed Jun. 3, 1980, Ser. No. 156,265
Int. Cl.³ A47C *17/04, 13/00*
U.S. Cl. 5—12 R **4 Claims**



1. An article of furniture, said article comprising:

a horizontally extending base member formed from heavy density rubber foam material;

a substantially vertically extending back member formed from heavy density rubber foam material,

said back member formed as a single piece;

means to support said base member and to internally support said back member,

said support means including a flat bottom plate shaped and dimensioned to be substantially coextensive with the bottom of said base member,

said bottom of said base member resting upon said bottom plate;

said support means further including a tubular member secured to said plate and substantially perpendicular in relationship thereto,

said tubular member having a central segment with a depending segment at each end thereof,

each said depending segment terminating in a foot,

each said foot secured to said plate,

said back member having a cavity formed therein to allow insertion of said central segment and said depending segments of said tubular member,

said base member having troughs formed therein to accommodate said feet of said tubular member; and

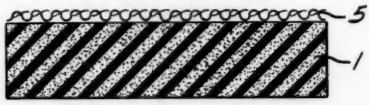
at least one seat cushion segment supported by said base member.

4,326,310

MATTRESS PAD

Carl R. Frankenberg, Oceanside, N.Y., assignor to American Foam Latex Corporation, Pittsburgh, Pa.

Division of Ser. No. 87,248, Oct. 22, 1979, Pat. No. 4,260,440.
This application Aug. 21, 1980, Ser. No. 180,048
Int. Cl.³ A47C *31/00*
U.S. Cl. 5—448 **2 Claims**



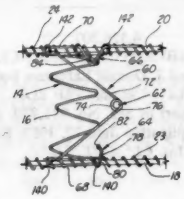
1. A mattress pad comprising an elastomer foam pad, a porous fabric having a coating on one side of aluminum silicone such that said coated fabric is porous, the non-coated side of said fabric secured to one side of said pad with an adhesive.

4,326,311

SELF-RELEASING LOCKING UNIT FOR AN INNER SPRING ASSEMBLY

Michael D. Paripovich, 109 Flanders, Chickasha, Okla. 73018

Filed May 12, 1980, Ser. No. 148,955
Int. Cl.³ A47C *23/04, 31/08*
U.S. Cl. 5—475 **35 Claims**



1. An inner spring assembly comprising:

a peripheral upper frame;

a peripheral lower frame;

resilient means for connecting the upper and the lower frame and to support the upper frame and the lower frame in a spaced apart relationship, the resilient means adapted to permit the upper and the lower frame to be moved to a first compressed condition wherein the upper and lower frames can be spaced a predetermined distance apart;

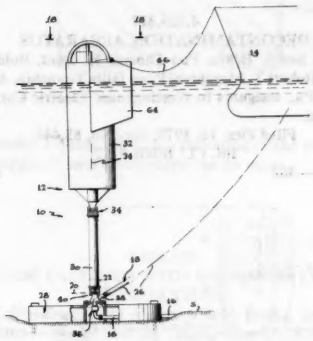
a hook disposed near one of the upper and lower frame, the hook being biased in a first position such that the hook is disposed substantially adjacent the plane of the frame near which the hook is disposed, the hook being movable to a second position wherein the hook is disposed substantially normal to the plane of the frame near which the hook is disposed; and

a hook receiver disposed near the other of the upper and lower frame, the hook receiver adapted to engage the hook when the hook is in the second position and the first and second frames are in the first compressed condition, the hook receiver further adapted to release the hook when the upper and lower frames are moved to a second compressed condition.

4,326,312
SINGLE LEG MOORING TERMINAL

Phillip H. Tang, Rosemead, Calif., assignor to Amtel, Inc., Providence, R.I.

Filed Apr. 30, 1979, Ser. No. 34,555
Int. Cl.³ B63B *21/52, 51/02*
U.S. Cl. 441—5 **1 Claim**



1. In a single leg mooring installation which includes a riser and buoy assembly extending up from the sea floor to near the sea surface to moor to a vessel, and a fluid conduit which can extend upwardly from the sea floor and sidewardly from an underwater location to the vessel to transfer a fluid cargo between a pipe near the sea floor and the vessel, and wherein the upper portion of the buoy assembly must be tiltable and the upper portions of both the buoy assembly and fluid conduit must be capable of rotating without limit about a substantially vertical axis to follow a drifting vessel, the improvement wherein;

said buoy assembly includes a lower nonrotatable portion, which is substantially nonrotatable about a vertical axis, an upper rotatable portion, and a vertical rotation joint disposed between them, and said buoy assembly also includes a tilt joint;

said fluid conduit includes a fluid swivel with its axis located substantially coaxial with the axis of said vertical rotation joint;

said vertical rotation joint is located below the tilt joint, said fluid swivel is located below the top of said tilt joint, and said conduit includes a sidewardly-extending portion extending from the rotatable portion of the fluid swivel and to the side of the buoy assembly at a level between the bottom of the vertical rotation joint and the top of the tilt joint; and

said vertical rotation joint includes a wide platform and a bearing assembly rotatably supporting said platform on said nonrotatable portion of said buoy assembly, the diameter of said platform being greater than the vertical height of said bearing assembly; and including

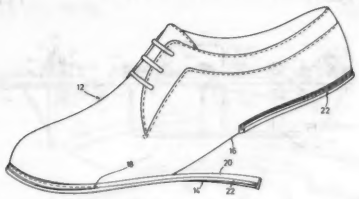
pipe support means connected to said sidewardly-extending portion of said conduit and to the radially outer portion of said platform.

4,326,313
METHOD OF MAKING FOOTWEAR

Douglas W. Bensley, 1385 Commissioners Rd. West, London, Ontario, Canada

Filed Dec. 5, 1979, Ser. No. 100,586
Int. Cl.³ A43D *9/00*; A43B *13/18, 3/24*
U.S. Cl. 12—142 D **7 Claims**

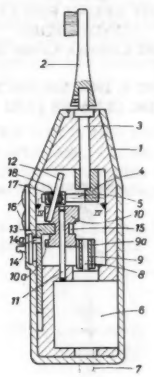
1. A method of making an article of footwear including providing a pre-formed upper having a peripheral lower edge portion, attaching a connecting strip to the peripheral lower edge portion of the upper so that the connecting strip surrounds the upper, said connecting strip having a profiled section providing a projecting extension, providing a preformed ring-like welt member, said welt member having an inner surface shaped for snapping engagement with the projecting extension of the connecting strip, snapping the welt member into engagement with the connecting strip, providing a preformed sole and heel unit with an upper peripheral surface engageable with a lower surface of the welt member, and attaching the sole and heel unit to the welt member by causing the upper peripheral surface of the sole and heel unit to adhere to the lower surface of the welt member.



4,326,314
ELECTRICALLY DRIVEN HAND-HELD APPARATUS FOR BODY CARE, IN PARTICULAR A TOOTHBRUSH OR MASSAGE APPARATUS

Michel-Antoine Moret, Chene Bourg, and Pierre-Jean Jousson, Geneva, both of Switzerland, assignors to Les Produits Associes. LPA, Switzerland

Filed Nov. 7, 1979, Ser. No. 92,046
Claims priority, application Switzerland, Nov. 17, 1978, 11819/78
Int. Cl.³ A46B *13/02*
U.S. Cl. 15—22 R **19 Claims**

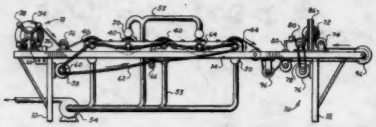


1. An electrically driven hand-held apparatus for body care such as a toothbrush or massage apparatus, comprising an instrument holder which is adapted for the attachment of a treatment instrument and which is drivable for oscillation about its longitudinal axis, a motor, a rotatably mounted support driven by the motor, an eccentric pin which is secured to the support, an inner part of the instrument holder defining a longitudinal slot which slot extends substantially radially in respect of the longitudinal axis of the instrument holder and in which the eccentric pin engages in a freely displaceable manner, and means for varying the distance between the axis of rotation of said support and the location of engagement of said eccentric pin in the longitudinal slot.

4,326,315
FILM CLEANER

Felix A. Miles, and Dale P. Roush, both of Amarillo, Tex., assignors to Ingenuity Incorporated, Amarillo, Tex.

Filed Jan. 21, 1980, Ser. No. 113,826
Int. Cl.[3] A47L 15/00; G03G 21/00
U.S. Cl. 15—77 7 Claims



1. A machine for reprocessing a rolled web of photostatic film, the web being about 19 inches (47.5 cm) wide and about 900 feet (274.3 meters) long and very thin and easily creased which if creased renders it unusuable, said machine comprising:

a. a frame,

b. a used roll holder on the frame,

c. a series of cylindrical bunny brushes rotatably mounted on the frame,

d. a series of vacuum nozzles on the frame, one contacting each bunny brush,

e. blower means for removing air from each vacuum nozzle operatively associated therewith,

f. two rewind cylinders on the frame,

g. a reclaimed core resting on the rewind cylinders,

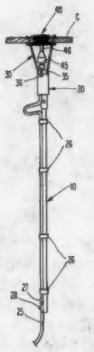
h. said used roll holder, all the bunny brushes, rewind cylinders and reclaimed core having axes which are parallel to each other, and

i. rotating means on the frame for rotating each of the bunny brushes and one of the rewind cylinders.

4,326,316
HOT STICK ROTARY BRUSH FOR CLEANING AERIAL CONDUCTORS

Alfred N. Dolenti, 192 Limerick Center Rd., Royersford, Pa. 19468

Filed Oct. 6, 1980, Ser. No. 194,387
Int. Cl.[3] A46B 13/02
U.S. Cl. 15—246 9 Claims



1. A device for cleaning aerial conductors such as are used for electric power and other purposes, said device comprising:

a. a rotary brush having a circumferential groove;

b. a power drive for driving said brush rotationally;

c. means connecting said power drive to said rotary brush;

d. a hanger guide having hook means at one end;

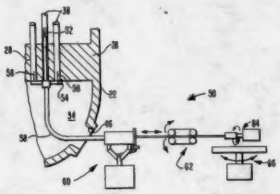
e. means mounting said hanger guide on said power drive in such position relative to said rotary brush that when said hanger guide is hooked over said aerial conductor, said conductor is engaged by said brush within the circumferential groove thereof; and

f. an insulated hot stick, one end of which is connected to the housing of said power drive.

4,326,317
DECONTAMINATION APPARATUS

Edward H. Smith, Brave, Pa.; Thomas H. Dent, Bolingbrook, Ill., and Robert T. Marchese, Penn Hills Township, Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 16, 1979, Ser. No. 85,444
Int. Cl.[3] B08B 9/02
U.S. Cl. 15—302 8 Claims



1. Apparatus for decontaminating tubular members comprising:

a nozzle capable of being disposed in a tubular member and having a channel therein inclined at approximately 20°–40° from the longitudinal axis of said nozzle for spraying a fluid therefrom;

a helically wound tube attached to said nozzle for conducting said fluid to said nozzle;

an inner member connected to said helically wound tube and having a bore therethrough for conducting said fluid to said helically wound tube and having a passage therein for allowing said fluid to enter said bore;

an outer member disposed around said inner member for rotatably supporting said inner member; and

a brush mounted on said helically wound tube and extending into contact with the inside surface of said tubular member for removing material from said tubular member when said brush is being rotated and while said fluid is being sprayed against said tubular member thereby decontaminating said tubular member.

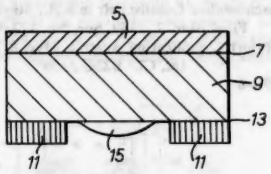
4,326,318
ELECTRODE-ACTIVE OXYGEN MONITOR

Henderikus J. DeBruin, Bellevue Heights, and Sukhvinder P. S. Badwal, Ingle Farm, both of Australia, assignors to The Flinders University of South Australia, Australia

Filed Jan. 16, 1980, Ser. No. 112,617
Claims priority, application Australia, Jan. 16, 1979, PD7374
Int. Cl.[3] G01N 27/12
U.S. Cl. 23—232 E 20 Claims

1. A method of determining the partial pressure of oxygen in an atmosphere at a known temperature, the method comprising applying a varying potential between a first metal electrode and a second metal electrode of an electrolytic cell located in said atmosphere, said electrodes being separated by an electrolyte having ionic oxygen mobility, monitoring the resistance between said first metal electrode and a third metal electrode of said electrolytic cell separated from said first metal electrode by said electrolyte and insulated from said second metal electrode, measuring the magnitude of a critical potential between said first and third electrodes at which a substantial change in the said resistance occurs, such critical potential

being equal and opposite to the free energy of formation of an oxide of the first electrode metal at the said known temperature, whereby a quantitative determination of the partial pressure of oxygen in said atmosphere can be made.



4,326,319

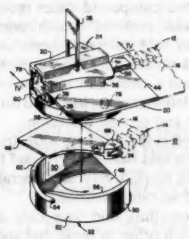
SLIDE FASTENER WITH IMPROVED END CONNECTIONS

Martin F. Friedberg, 7233 Aberdeen Ave., Dallas, Tex. 75230

Continuation-in-part of Ser. No. 20,318, Mar. 15, 1979, Pat. No. 4,232,430, which is a continuation-in-part of Ser. No. 940,255, Sep. 7, 1978, Pat. No. 4,232,429, which is a continuation-in-part of Ser. No. 895,935, Apr. 13, 1978, abandoned. This application Oct. 9, 1979, Ser. No. 82,727

Int. Cl.³ A44B *19/36*

U.S. Cl. 24—205.11 R **10 Claims**



1. A device for connecting the ends of a separable zipper of the type having first and second rows of teeth disposed along the opposed edges of supporting stringers, the device comprising:

a slider having top and bottom plates held in spaced-apart parallel planes by a center post, the plates having facing side rims defining first and second side slots through which the stringers pass, the front edges of the side rims defining first and second ports on opposite sides of the center post, the ports leading to a common passageway within the slider where the teeth are progressively engaged or disengaged depending on the direction of slider movement;

a base terminal disposed at the rearward end of the first row of teeth and adapted to carry the slider when the rows are fully disengaged;

a receiving terminal disposed at the rearward end of the second row of teeth, the receiving terminal including wall portions defining an aperture; and

first means affixed to the bottom of the slider, said means being insertable into the aperture in the direction generally perpendicular to said parallel planes to permit the ports of the slider to be aligned for receiving the rearmost ends of the rows of teeth upon forward movement of the slider.

4,326,320

LEVER-OPERABLE FASTENER FOR A SHOE

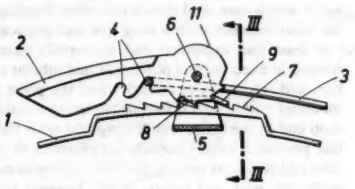
Tilo H. Riedel, Salzburg, Austria, assignor to Sesamat Anstalt, Schaan, Liechtenstein

Filed Nov. 7, 1979, Ser. No. 91,986

Claims priority, application Austria, Nov. 15, 1978, A8152/78

Int. Cl.³ A43C *11/00*; **A43B** *11/00*

U.S. Cl. 24—70 SK **18 Claims**



1. A lever-operable fastener for a shoe, comprising

a rack formed with rack teeth and adapted to be attached to one part of said shoe,

a lever mount mounted on said rack and movable along the same and defining a pivotal axis,

a tension lever connected to said lever mount and pivotally movable about said pivotal axis,

a tension loop adapted to be attached to another part of said shoe and interengageable with said tension lever and adapted to be tensioned by a movement of said lever mount along said rack in a predetermined direction,

a ratchet mechanism comprising driver means carried by said lever mount and movable in unison with said tension lever and arranged to cooperate with said rack teeth during a pivotal movement of said tension lever in a predetermined sense to move said lever mount along said rack in said predetermined direction, and

releasable means arranged to restrain said lever mount against a movement along said rack opposite to said predetermined direction during a pivotal movement of said tension lever opposite to said predetermined sense.

4,326,321

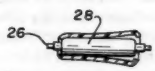
EXPANDING SLEEVE FOR WRIST BAND CONNECTOR

Aldo Colognori, 69 Lawton Ave., Cliffside Park, N.J. 07010, assignor to Aldo Colognori; Sebastian Zuptichini, both of Cliffside and Thomas McBride, Washington Township, all of, N.J.

Filed Jun. 10, 1980, Ser. No. 158,170

Int. Cl.³ A44C *5/18*

U.S. Cl. 24—265 B **7 Claims**



1. A safety sleeve and retainer in combination with a pivot pin post having reduced end portions adapted to enter and be retained in apertures provided in opposed ear portions of a wrist watch case, said safety sleeve and pivot pin post adapted to pass through a loop end as provided and formed in a wrist watch band or strap, the pivot pin post having larger pin ends sized and adapted to be received by a tubular rigid sleeve with said larger pin end slidable in said tubular rigid sleeve and urged to an outward limit by a compression spring carried within said rigid tubular sleeve, the end of the rigid tubular sleeve being turned inwardly when and where the larger pin end is slidably mounted, said pivot pin post and safety sleeve as an assembly mountable in opposed ear portions of a wrist

watch case, said safety sleeve and retainer including in its construction and configuration;

(a) a tubular outer member having a thin wall and of at least a semi-rigid composition and of selected length;

(b) an inturned end formed on an entering end of the tubular outer member and providing means for securing and retaining said tubular outer member to the outer diameter of said pivot pin post and with a determined overall length less than the distance between opposed ear portions of said wrist watch case, said means including forming this tubular outer member with a snug first end portion, and

(c) at least one expanded and outwardly extending leaf formed in a second end portion of said tubular outer member, said safety sleeve as and when the pivot pin post is mounted within said safety sleeve being a slide fit in said loop end in the wrist watch strap and with the expanded leaf portion a snugly slidable interference fit within said loop end while preventing loss and/or displacement of the pivot pin post and safety sleeve because of clearance between the inner diameter of the loop end and outer diameter of the pivot pin post.

4,326,322

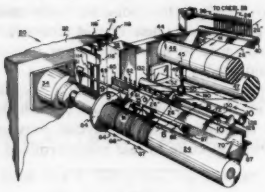
BEAMING MACHINE

Gerhard O. Gaiser, Norwalk, Conn., assignor to American Fabrics Company, Bridgeport, Conn.

Filed Mar. 15, 1979, Ser. No. 20,933

Int. Cl.³ D02H *5/00, 13/08, 13/26*

U.S. Cl. 28—187 **12 Claims**



1. An improved beaming machine of the type having at least one beam upon which yarn ends are wound from at least one storage creel, a motor for rotationally driving the beam, a reed, and a frame for housing the motor, beam, and reed, in which the improvement is characterized by:

(A) a plurality of beams and reeds **(65)**;

(B) a multiple traverse assembly **(53)** having,

(1) means for mechanically moving in a reciprocating motion;

(2) a transverse movement translation member **(102, 103** or **104)** for each beam connected at one end to the reciprocating motion means and having a manually adjustable fulcrum;

(3) means for manually adjusting the fulcrum of each translation member;

(4) means, connected to each translation member and to each reed, for mechanically connecting the translation member to the reed;

whereby each reed associated with each beam is manually adjustable for any traverse movement desired.

4,326,323

CRANKSHAFT MILLING MACHINE

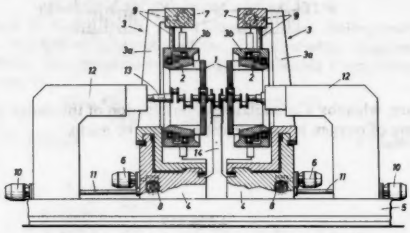
Bruno Kralowetz, and Gottfried Blaimschein, both of Steyr, Austria, assignors to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Gesellschaft m.b.H., Steyr, Austria

Filed Mar. 7, 1980, Ser. No. 127,949

Claims priority, application Austria, Mar. 8, 1979, 1728/79

Int. Cl.³ B23C *3/06*

U.S. Cl. 29—6 **3 Claims**



1. A machine for milling crankshafts having a plurality of cranks, comprising

a machine bed,

two workpiece supports mounted on said bed and spaced apart in a first direction and adapted to support a crankshaft workpiece and to hold it in a fixed position against rotation,

carriage means mounted on said bed and movable relative thereto in said first direction,

first and second compound slides spaced apart in said first direction and each of which comprises a base slide mounted on said carriage means and movable relative thereto in a second direction at right angles to said first direction, and a cross slide mounted on said base slide and movable relative thereto in a third direction at right angles to said first and second direction,

first and second reversible base slide drive means operatively connected to said base slides of said first and second compound slides, respectively, and operable to move said base slide in said second direction,

means for controlling said base slide drive means independently of each other in sense and speed,

first and second reversible cross slide drive means operatively connected to said cross slides of said first and second compound slides, respectively, and operable simultaneously with said first and second base slide drive means, respectively, to move said cross slides of said first and second compound slides, respectively, in said third direction, and

means for controlling said cross slide drive means independently of each other in sense and speed.

4,326,324

MANUFACTURE OF ELECTRIC LIGHT SOURCES

Stanley W. Stephens, Lightwater, England, assignor to Badalex Limited, England

Continuation of Ser. No. 965,051, Nov. 30, 1978, abandoned. This application Apr. 18, 1980, Ser. No. 141,598

Claims priority, application United Kingdom, Dec. 22, 1977, 53522/77

Int. Cl.³ H01J *9/00*

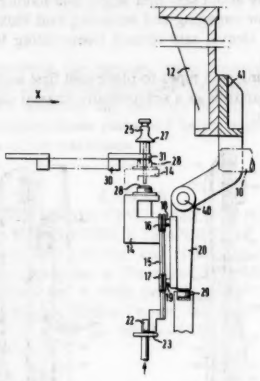
U.S. Cl. 29—25.19 **4 Claims**

1. A sealing head for a rotary turret sealing machine for sealing mounts to the ends of fluorescent lamp tubes of the type having a horizontal axis of rotation;

said sealing head being one of at least one pair of such sealing heads each of which is arranged to receive a mount assembly that includes an exhaust tubulation and which heads serve for simultaneously sealing a said mount assembly to

the respective ends of a tubular lamp envelope that extends between the heads;

said sealing head including a head frame forming part of a rotary turret and a mount holding member secured to said head frame for rotation therewith by means of a connection that permits the mount holding member to be angularly displaced relative to the head frame during rotation thereof, the angular displacement being about an axis



extending at 90° to the said horizontal axis, and in a direction away from the other sealing head of said pair; and

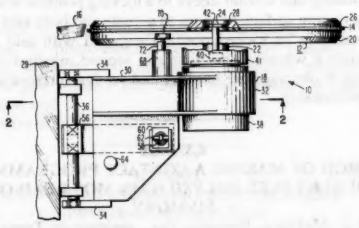
means for effecting said angular displacement of said mount holding member about said connection relative to the head frame, between a mount sealing position in which a mount assembly held in said mount holding member is oriented with the axis of said tubulation parallel and noncoplanar with the said horizontal axis of rotation.

4,326,325

METHOD AND APPARATUS FOR DEFLASHING MOLDED RECORDED DISCS

Robert W. Chambers, Willingboro, and Frank Cuomo, Jr., Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 21, 1980, Ser. No. 170,814
Int. Cl.³ B23B *7/00, 1/00;* **B23C** *1/00*
U.S. Cl. 29—27 C **10 Claims**



1. Apparatus for removing flash from the edge of a flat, circular, recorded disc comprising

means for supporting the disc for rotation about the center of the disc;

a rotary cutter mounted adjacent said supporting means, and extending transversely across the peripheral edge of said supporting means;

means for selectively moving said cutter toward said supporting means so as to bring the cutter into engagement with the edge of a disc supported thereon and away from said supporting means; and

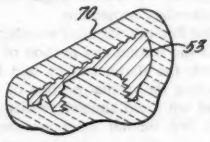
means mounted adjacent the disc support and adapted to remove a major portion of the flash from the disc prior to the cutter being moved against the disc.

4,326,326

METHOD OF MAKING METAL GOLF CLUB HEAD

Paul MacDonald, Villanova, Pa., assignor to The Merion Corporation, Villanova, Pa.

Filed Jul. 9, 1980, Ser. No. 167,330
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—428 **2 Claims**



1. In a method of making a golf club head having a lead insert positioned therein directly behind the center of the intended striking surface of said head, comprising:

providing a split mold assembly which, when assembled for casting, defines a first mold cavity of the same configuration as said golf club head;

filling said cavity with a molten wax-like material, and thereafter cooling said mold assembly to solidify said wax-like material in the form of a wax-like image of said golf club head;

separating said split mold assembly to release said wax-like image from said split mold assembly, and then forming on said removed wax-like image a frangible coating of material;

thereafter, melting said wax-like material within said coating and withdrawing it from within said coating to leave a second mold cavity in said coating of the same configuration as said golf club head;

filling said second mold cavity with molten metal;

cooling said molten metal in said second mold cavity to permit it to solidify and form said golf club head; and

thereafter removing said frangible coating from said formed golf club head.

the improvement comprising:

during said forming of said wax-like image, providing an externally-threaded protrusion on said split mold assembly in a postion such that the threaded portion of said protrusion extends into said first mold cavity forwardly from the rear side thereof, thereby to form an internally-threaded recess extending into the rear surface of said wax-like image when it has solidified;

after said solidifying of said wax-like image and before covering it with said coating material, unscrewing said threaded protrusion from said wax-like image to leave exposed said internal threads in said recess in said wax-like image, whereby said internal threads are replicated in said golf club head; and

after said cooling of said molten metal to form said club head and after said frangible coating is removed, screwing an insert comprising lead into said internal threads thereof.

4,326,327

METHOD OF ASSEMBLING A CONDUIT JOINT

Russell C. Cox, Lyman, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 926,477, Jul. 20, 1978, Pat. No. 4,245,858.
This application Aug. 25, 1980, Ser. No. 180,729
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—434 **1 Claim**

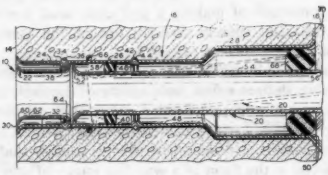
1. A method of assembly of a conduit joint having a tubular

outer housing formed of organic polymeric material capable of being fusion-welded and consisting of a medial portion and first and second opposite end portions, a first tubular inner member having at least one flared end, a second tubular inner member having opposite flared ends, and a resilient annular seal, comprising the steps of:

positioning the second end portion of said tubular outer housing in coaxial alignment with the medial portion of said tubular outer housing;

fusing the adjacent ends of the medial portion and the second end portion of said tubular outer housing so as to fixedly secure the medial portion and the second end portion together in coaxial alignment and to form an inwardly extending projection;

positioning said first tubular inner member within the medial portion and the second end portion of said tubular outer housing with the flared end of said first tubular inner member within the medial portion of said tubular outer housing and with said annular resilient seal disposed between said first tubular inner member and the medial portion of said tubular outer housing intermediate and



engageable with the flared end of said first tubular inner member and said inwardly extending projection to provide a seal between said first tubular inner member and said tubular outer housing;

positioning the first end portion of said tubular outer housing in coaxial alignment with the medial portion of said tubular outer housing;

positioning said second tubular inner member within the first end portion of said tubular outer housing; and

fusing the adjacent ends of the medial portion and the first end portion of said tubular outer housing with one flared end of said second inner member positioned within the medial portion of said tubular outer housing so as to fixedly secure the medial portion and first end portion together in coaxial alignment and to form another radially extending projection engageable with the one flared end of said second inner member positioned within the medial portion to secure said second inner member within said tubular outer housing and to retain both said annular resilient seal and said first tubular inner member within said tubular outer housing.

4,326,328

METHOD OF RELEASABLY CONNECTING A PAIR OF PIPES

Bruce J. Watkins, Palos Verdes Estates, Calif., assignor to Regan Offshore International, Inc., Torrance, Calif.

Division of Ser. No. 875,639, Feb. 6, 1978, Pat. No. 4,200,312. This application Dec. 10, 1979, Ser. No. 101,417

Int. Cl.³ B23Q *3/00*

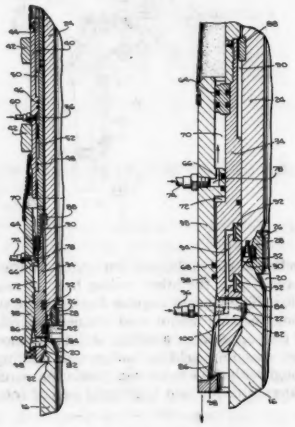
U.S. Cl. 29—464 **3 Claims**

1. The method of releasably connecting a pair of pipes comprising the steps of:

(a) providing a first mandrel conduit connected at one end to one of the pipes and having a seating surface and an external locking surface on the other end;

(b) providing a second mandrel conduit connected at one end to the other of the pipes and having a seating surface on the other end adapted to sealably mate with said seating surface of said first mandrel conduit when said first and second mandrel conduits are disposed in end-to-end relationship along a common longitudinal axis, said second mandrel including a first sleeve disposed concentrically about said second mandrel and including movable locking means adapted for movement between a locked position engaged with said locking surface and an unlocked position disengaged from said locking surface, said first sleeve being longitudinally movable; said second mandrel further including a second sleeve disposed concentrically about said first sleeve and having an actuating surface for engaging and actuating said locking means of said first sleeve, said second sleeve being longitudinally movable;

(c) positioning said pipes to place said first and second connector mandrels in a substantially coaxial slightly spaced alignment;



(d) extending a portion of said first sleeve beyond the end of said second mandrel conduit by sliding said sleeve from a retracted position wherein said first sleeve is retracted over said second mandrel conduit, said first sleeve being shaped such that when in said extended position said first sleeve fits concentrically about said external locking surface of said first mandrel conduit with said locking means in position for engagement with said locking surface and with said seating surfaces mated;

(e) sliding said second sleeve to a locking position where said actuating surface engages to actuate and hold said locking means in its locked position engaged with said locking surface whereby said first and second mandrel conduits are drawn together holding said seating surfaces in seated relationship.

4,326,329

METHOD OF MAKING A CONTACT PROGRAMMABLE DOUBLE LEVEL POLYSILICON MOS READ ONLY MEMORY

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

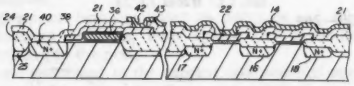
Division of Ser. No. 907,235, May 18, 1978, Pat. No. 4,219,836. This application Feb. 28, 1980, Ser. No. 125,596

Int. Cl.³ H01L *21/22, 21/28*

U.S. Cl. 29—571 **9 Claims**

1. A method of making a read-only-memory which includes the steps of: forming a plurality of insulated gate field effect transistors in a face of a semiconductor body, each of the transistors having a source-to-drain path and a gate, the transistors being in a regular pattern of rows and columns to provide an array of memory cells; applying segments of polycrystalline silicon to said face to provide separate gates for the transistors;

applying an insulating coating to the face over said gates; selectively removing said insulating coating from some of the gates; applying strips of conductive material to the face insulated from the gates by said insulating coating; except where



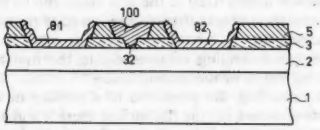
selectively removed; the memory being programmed by said opening of apertures in the insulating coating before applying the conductive material, the apertures directly overlying the gates and source-to-drain paths and being opened over only selected ones of the transistors.

4,326,330

PROCESS FOR PRODUCING A SELF-ALIGNED GRID FIELD-EFFECT TRANSISTOR

Joël LePage; Michel Laviron, and Henri Derewonko, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jul. 3, 1980, Ser. No. 165,777
Claims priority, application France, Jul. 6, 1979, 79 17603
Int. Cl.³ H01L *21/28*
U.S. Cl. 29—571 **5 Claims**



1. A process for producing a self-aligned grid field-effect transistor, comprising at least the following steps:

formation, on the active semiconductor layer of the transistor, of a mask formed by a first insulating or semi-insulating material comprising windows defining the dimensions and the final location of the source, the gate and the drain of the transistor to be produced;

deposition of a layer of a second insulating material, selectively etchable by an agent which does not etch (or etches at a much slower rate) the first material;

opening, by photo-etching effected by means of said agent, of source and drain windows laying bare the semiconductor;

deposition of ohmic source and drain contacts;

opening, by photo-etching carried out by means of said agent, in the second material, of a window creating the initial gate window and laying bare therein the semiconductor; and

deposition of a gate contact.

4,326,331

HIGH COUPLING RATIO ELECTRICALLY PROGRAMMABLE ROM

Daniel C. Guterman, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 17, 1979, Ser. No. 75,854
Int. Cl.³ H01L *21/72*
U.S. Cl. 29—571 **4 Claims**

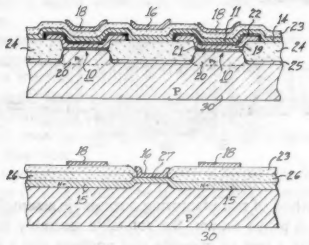
1. A method of making an electrically programmable semiconductor memory cell of the floating gate type comprising the steps of:

forming a first field oxide coating on a face of a body of semiconductor material, the first field oxide surrounding areas to later have transistors formed therein on said face,

forming heavily doped source and drain regions on opposite sides of a channel region in said areas, the source and drain regions being covered with a second field oxide at said face,

applying a first layer of conductive material on said face separated from the channel region by thin gate oxide,

patterning the first layer to partially define a floating gate which is much larger in area than said channel and extends out over said first field oxide by a substantial amount,



applying a second layer of conductive material on said face overlying the first layer separated therefrom by a thin insulator coating,

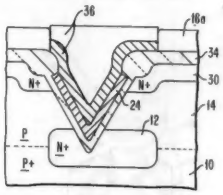
and thereafter patterning the second layer to define a control gate while at the same time patterning the first layer to define edges of the floating gate.

4,326,332

METHOD OF MAKING A HIGH DENSITY V-MOS MEMORY ARRAY

Donald M. Kenney, Shelburne, Vt., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 28, 1980, Ser. No. 173,508
Int. Cl.³ H01L *21/265, 21/308*
U.S. Cl. 29—571 **10 Claims**



1. The method of making a matrix of interconnected self-aligned semiconductor devices on the surface of a semiconductor substrate comprising the steps of:

providing an first masking layer on the surface on the surface of a semiconudctor substrate of a first conductivity type, said masking layer having a first plurality of parallel spaced first regions of a first thickness separated by a second plurality of regions of a second thickness greater than said first thickness;

selectively removing a plurality of parallel strip-like regions of said masking layer in a pattern oriented substantially perpendicular to said first regions to expose the surface of said substrate only under those areas of said masking layer common to said first regions and said strip-like regions;

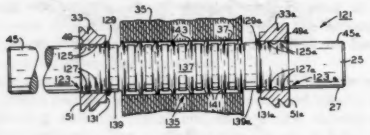
forming a plurality of self-aligned V-MOS semiconductor devices in said exposed areas of said substrate, each of said devices including a gate electrode layer, and then

forming self-aligned conductive means in said substrate to interconnect said MOS semiconductor devices, said conductive means being defined by said first regions in said masking layer and by said gate electrode layers.

4,326,333
METHODS OF MANUFACTURING A PRIME MOVER AND A ROTATABLE ASSEMBLY THEREFORE

Charles W. Otto, DeKalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 889,963, Mar. 24, 1978, Pat. No. 4,215,287.
This application Nov. 8, 1979, Ser. No. 92,608
Int. Cl.³ H02K 15/02
U.S. Cl. 29—598 22 Claims



1. A method of manufacturing a rotatable assembly adapted for use in a prime mover, the rotatable assembly including a shaft having a pair of opposite end portions and a peripheral surface between the opposite end portions, the method comprising the steps of:

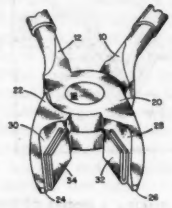
(a) deforming from the shaft a plurality of generally annular axially spaced apart ridges and extending at least one of the ridges of the plurality thereof in part generally radially beyond the peripheral surface of the shaft further than the other ridges of the plurality thereof; and

(b) passing a generally annular thrust device over one of the opposite ends of the shaft into gripping engagement about at least some of the other ridges and abutting a confronting portion on the thrust device with the at least one ridge.

4,326,334
HAND HELD RESTRAINING CUTTER

Steven J. Roux, Forge Village Rd., Groton, Mass. 01450

Filed Sep. 11, 1980, Ser. No. 186,113
Int. Cl.³ B26B 17/00
U.S. Cl. 30—124 5 Claims



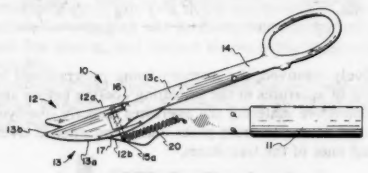
1. In a hand held cutting tool including: a pair of lever arms, pivotally connected about a point near one end, providing opposing handles on the longer end from the pivot point, and a pair of jaws on the shorter end from the pivot point, each jaw connected to one of said pair of lever arms: a cutting edge on each of said jaws, positioned to mate with the cutting edge on the other said jaw, with said jaws in a closed position, the improvement comprising;

a pair of resilient, work restraining members, each member being "U" shaped in cross section having one side affixed to one of said jaws; with the other side free to move, and extending parallel to and in juxtaposition with the cutting edge, wherein the base of one member abutts the base of the other member when the jaws are in the closed position, and said members adapted to roll back from the cutting edge upon application of a force caused by a workpiece being placed between the cutting edges and the jaws moved to the closed position.

4,326,335
METAL SHEARS

Ray E. Morton, 653 N. 1200 W., D101, Salt Lake City, Utah 84101

Filed Oct. 2, 1980, Ser. No. 193,037
Int. Cl.³ B26B 13/28
U.S. Cl. 30—254 3 Claims



1. Reversible shears comprising

a first blade having one flat surface and a generally V-shaped configuration with the legs of the V both providing cutting surfaces terminating at a common tip;

a second blade having one flat surface and a blade edge forming a first cutting edge and a second cutting edge;

means pivotally connecting the first and second blades whereby the flat surfaces of the first and second blades are in face-to-face engagement;

first handle means fixed to the first blade and forming a rigid continuation of said first blade at an edge remote from the common tip;

a pivot pin extending transversely to the first and second cutting edges of the second blade;

means mounting the pivot pin to a surface of the second blade remote from the flat surface thereof and at a location intermediate the first and second cutting edges;

and

second handle means having one end thereof mounted to pivot around said pivot pin whereby when the second handle means is in one extreme pivoted position, it forms a handle for the first cutting surface of the second blade as said first cutting surface cooperates to provide a scissor cutting action with one cutting surface of the first blade during movment of the handles relative to one another and when the second handle means is in a second extreme position, it forms a handle for the second cutting surface of the second blade as it cooperates to provide a scissor cutting action with the other cutting surface of the first blade.

4,326,336
GAUGE

Michael J. Hreha, 415 Independence Ct., Fairport Harbor, Ohio 44077

Filed Jul. 12, 1976, Ser. No. 704,439
Int. Cl.³ G01B 5/08
U.S. Cl. 33—174 Q 8 Claims

1. A gauge device comprising:

a base having a top face and a bottom underface with supporting surface areas on the lowest extremity of its underface defining a plane supporting face which is adapted to rest slidably on the upper planar face of a granite gauging block and operative to slide on said upper planar face of the block in all directions parallel to said planar face and to support the base in fixed angular relation to the plane of said planar face in all positions into which the base is moved on said planar face;

a pair of positioning jaws on, and in fixed relation to, the base and having opposed faces arranged in divergent relation from each other from a location within the periphery of the base, which location is inwardly from a side wall of the base, outwardly to, and opening through, said side wall;

said opposed faces of said pair of jaws extending entirely through the base from top to bottom;

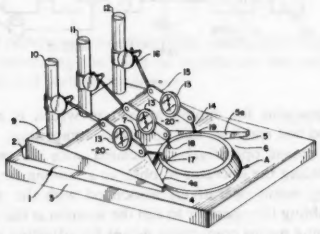
at least one supporting post mounted on the base and extending upwardly therefrom in fixed position axially, circumferentially, and transversely of the post relative thereto,

a support,

said support being mounted on said post and movable to different positions, both axially and circumferentially relative to the post;

means connected to the support and post and operable to clamp the support fixedly in said preselected positions,

said support being adapted to detachably support an adjustable dial indicator having a movable contact feeler, in preselected positions relative to said support in all of said



preselected fixed positions of the support, relative to the post and jaws, in which positions its movable contact feeler can be engaged, under light pressure selectively directly against various selected angularly related peripheral surface areas of an article resting on its own base on the gauge block, by movement of said gauge base on said block and while said jaws are held in engagement with said peripheral surface areas;

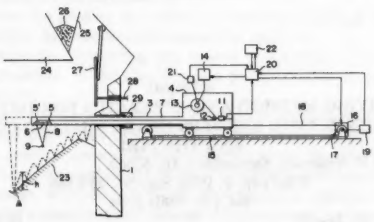
said defined plane supporting face on the underface of the gauge base being of such lateral extent that the gauge base, in and of itself, is capable, while resting on said planar face and supporting said post, of maintaining its said fixed angular relation to the plane of said planar supporting face.

4,326,337

MEASURING INSTRUMENT FOR THE PROFILE OF PILED CHARGE OF A BLAST FURNACE

Keiichi Akimoto, Kurashiki, and Tsuyoshi Tsuchida, Kobeshi, both of Japan, assignors to Kawasaki Seitetsu Kabushiki Kaisha, Kobeshi, Japan

Filed May 1, 1980, Ser. No. 145,697
Int. Cl.³ G01B 5/20, 7/28
U.S. Cl. 33—174 PA **2 Claims**



1. An apparatus for measuring the piling profile of a blast furnace charge, comprising:

a guide pipe including at least a distal end inserted in said blast furnace in a radial direction;

rope means with at least a part of said rope means guidingly extending through said guide pipe, said at least a part of said rope means including a loop extending out of said distal end of said guide pipe at two points;

plumb means slidably attached to said loop of said rope means;

a casing fixed to the other end of said guide pipe;

a load detector fixed to said casing and including pulley means for said rope means, said load detector adapted to detect changes in the tension of said rope means and to generate a signal dependent upon said changes in said tension;

a drum in said casing and adapted to wind and unwind said rope means;

means for rotating said drum;

first revolution counter means adapted to detect the number of revolutions of said drum;

means for moving said guide pipe and said casing in said radial direction;

second revolution counter means adapted to detect the position of said guide tube in said radial direction and to generate a signal dependent upon said position; and

detecting controller means adapted to receive said signals from said load detector and said first and second revolution counter means, and including means for calculating the profile of said charge based upon said signals;

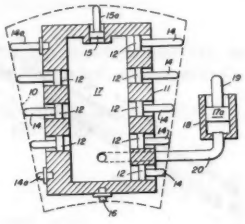
whereby said slidable attachment of said plumb means to said loop prevents swinging of said loop during radial movement of said guide pipe.

4,326,338

AREA COMPARISON GAGE

Robert A. Plante, Irving, Mass., assignor to The L.S. Starrett Company, Athol, Mass.

Filed Sep. 10, 1980, Ser. No. 185,682
Int. Cl.³ G01B 7/28
U.S. Cl. 33—174 PA **11 Claims**



1. In a comparison gage for directly measuring the deviation in cross-sectional area of a passage from a nominal value, the gage having

means for forming an enclosed hydraulic fluid chamber,

at least a first and a second sensor piston slidably received in said chamber for displacing fluids therein according to the algebraic sum of the individual displacement of said pistons, said sensor pistons arranged for linear displacement in response to deviations from nominal values of respective dimensions of said passage along measurement axes, the ratio of the cross-sectional areas of said respsective pistons being at least approximately equal to the inverse ratio of corresponding nominal dimensions of said passage along said measurement axes respectively,

an output piston in fluid flow communication with said chamber for linear displacement in proportion to the displacement of fluid by said sensor pistons,

a plurality of finger means, at least one finger means being movable along each of said measurement axes,

means for supporting first and second groups of at least one each of said finger means so that each movable finger means is in driving relation with first and second groups of at least one each of said sensor pistons respectively, and

said first and second groups of finger means being arranged to interiorly engage boundaries of a passage for substantially linear displacement along substantially prependicular first and second groups of parallel measurement axes respectively,

wherein the improvement comprises

at least one movable finger means of said first group of finger means comprising

a rotating section, said rotating section being mounted for rotational movement about a section rotation axis substantially perpendicular to a measurement axis associated with said movable finger means, and each said rotating section has

an extended measurement surface, said measurement surface aligned with and substantially intersecting said section rotation axis, whereby a center point of said measurement surface is substantially stationary as said section rotates.

4,326,339

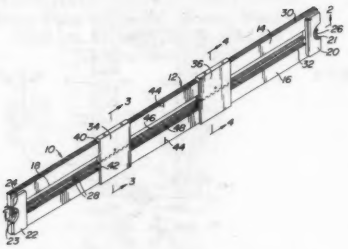
DEVICE FOR LOCATING CENTER POSITIONS

Carlo Marino, 1420 Tasker St., Philadelphia, Pa. 19145

Filed Mar. 3, 1980, Ser. No. 126,783

Int. Cl.³ G01B *3/30*

U.S. Cl. 33—191 **10 Claims**



1. A device for locating center positions, comprising:

(a) elongated frame members spaced by a slot extending substantially the longitudinal length of the frame members, a center point index marker at approximately the longitudinal midpoint of one of the frame members;

(b) two pins journaled in and extending between the frame members, one pin being at each end of the slot and disposed so that the axes of the pins lie in a plane perpendicular to the center line of the slot;

(c) an endless cord disposed within the slot and around the pins thereby forming a taut endless pulley circuit having an upper run and a lower run;

(d) two end-point markers, each marker having a passageway through which a run of said cord extends, means in each passageway joining one marker to the cord on the upper run of the pulley circuit and the other marker to the cord on the lower run of the pulley circuit, the points of affixation being such that the markers abut each other at the center point index marker of the frame; and

(e) one of the frame members being generally flat and having a length indicating distance scale provided thereon adjacent said markers.

4,326,340

DEVICE FOR AIMING OF A WEAPON

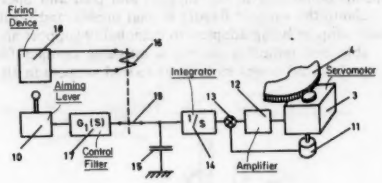
Ake Blomqvist, and Kurt Dahlberg, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Dec. 29, 1978, Ser. No. 974,581

Claims priority, application Sweden, Jan. 18, 1978, 78006251

Int. Cl.³ F41G *3/08;* **G06F** *15/58*

U.S. Cl. 33—238 **20 Claims**



1. Apparatus for aiming a weapon which is movable in elevation and traverse, said apparatus comprising:

sight means operatively associated with the weapon for enabling the operator to observe a moving target;

aiming means operatively associated with the weapon for enabling the operator to aim the weapon at the target, said aiming means comprising means for adjusting the angular position and the angular velocity of the weapon in elevation, said adjusting means comprising a gear arc attached to the elevating portion of the weapon, a first servomotor for rotating said gear arc to elevate the weapon, a first amplifier having its output connected to said first servomotor, a first angular position or angular velocity generator driven by said first servomotor and connected at its output via a first summing means to the input of said first amplifier, and a first control filter connected at its output to said first summing means;

means for firing the weapon; and

means responsive to said firing means for holding constant, during the time firing is taking place, one of the angular position or the angular velocity in elevation which was in existence for the weapon just prior to actuation of said first means, said holding means comprising first sample and hold means operated by said firing means and connected between said first control filter and said first summing means for disconnecting said first control filter from said first summing means during the time firing is taking place.

4,326,341

DRYING METHOD AND APPARATUS FOR DRYING PRUNES, FISH, BREWERS GRAIN, SHELLED CORN, AND THE LIKE

Max F. Anderson, Stewardson, Ill. 62463

Filed Sep. 8, 1980, Ser. No. 185,166

Int. Cl.³ F26B *5/04*

U.S. Cl. 34—27 **11 Claims**

1. Apparatus for drying material comprising

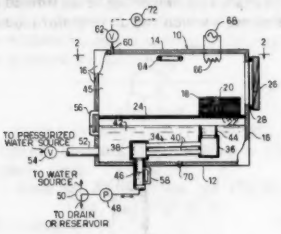
a fluid-tight vacuum tank,

means for supplying liquid to the tank to partially fill the same,

means for supporting material to be dried inside the tank above the surface of the liquid contained therein,

a surface condenser inside the tank adjacent the tank bottom

within said liquid for condensing vapor evaporated from said material to be dried, and



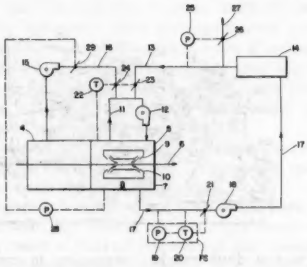
means for removing condensate from said surface condenser while preventing the entry of outside air into said tank through said surface condensor.

4,326,342

MULTI-ZONE OVEN WITH COOL AIR MODULATION

Alex J. Schregenberger, Neshanic, N.J., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Aug. 7, 1980, Ser. No. 176,251
Int. Cl.³ F26B *13/02, 21/12*
U.S. Cl. 34—47 **17 Claims**



1. An oven, comprising:

(a) at least one chamber which is substantially sealed from the ambient atmosphere;

(b) means for guiding an element, to be heated, through the chamber in a substantially horizontal pathway;

(c) means for circulating gas, heated to a certain desired temperature, to the chamber at a predetermined desired pressure;

(d) means for circulating gas, which is cool compared to the heated gas, to the chamber for mixture with the heated gas, prior to circulation of the mixture to the chamber for impingement against the element as it travels through the chamber, to produce in the chamber a gaseous atmosphere having a predetermined desired temperature and pressure;

(e) means for exhausting gas from the chamber at a predetermined constant flow rate;

(f) means for monitoring the gas pressure within the chamber; and

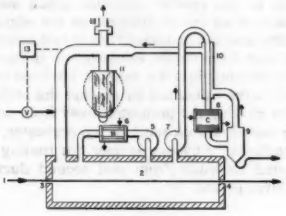
(g) means for first modulating the flow of cool gas to the chamber when the gas pressure within the chamber varies from a desired norm.

4,326,343

APPARATUS AND METHOD FOR RECOVERING VOLATILE COMPOUNDS

Richard K. Rathmell, 12 Pine Tree Rd., Ramsey, NJ 07446

Filed Jun. 10, 1980, Ser. No. 158,079
Int. Cl.³ F26B *21/10*
U.S. Cl. 34—51 **3 Claims**



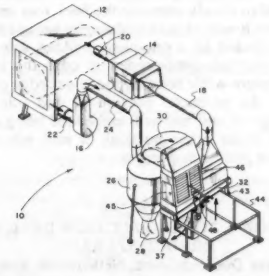
1. Apparatus for recovering volatile compounds which are evaporated within an oven, said oven having relatively small openings to the outside atmosphere and having means to circulate the contained oven atmosphere of vapor and non-condensable gas to a cooler where part of the vapor may be condensed, and means to return the non-condensed portion of the oven atmosphere to the oven, the improvement comprising a relatively flexible expansion-contraction chamber having means to receive and become inflated with excess oven atmosphere and with relatively little increase in pressure when the rate of evaporation temporarily exceeds the rate of vapor condensation, and conversely, having means to be deflated with relatively little decrease in pressure and to return the contained atmosphere when the rate of vapor condensation temporarily exceeds the rate of evaporation.

4,326,344

LAUNDRY DRYING SYSTEM AND METHOD

David G. Smith, Fort Wayne, Ind., assignor to Q-dot Corporation, Dallas, Tex.

Filed Nov. 8, 1976, Ser. No. 739,816
Int. Cl.³ F26B *11/04*
U.S. Cl. 34—54 **2 Claims**



1. A laundry drying system, comprising:

a drying chamber;

blower means for generating a flow of air entering the chamber and a flow of air exhausted therefrom;

heater means for heating said entering air during a drying period and ceasing to heat the entering air during a cool-down period;

a preheater, including:

a first duct carrying said flow of entering air before said entering air reaches the heater means;

a second duct carrying said flow of exhausted air, in an

approximately downward direction, said ducts being adjacent and joined for movement as a unit;

a plurality of heat pipes, each projecting into both of said ducts, with the end of each pipe in the second duct being lower than the opposite end of the pipe in the first duct; and

a plurality of planar fins in each of the ducts, each fin contacting all of the heat pipes, with the fins sufficiently close to one another that lint which may be in said exhausted air can accumulate on the edges of said fins, whereby heat can be transferred to said entering air in the first duct from hotter, exhausted air in the second duct;

means for filtering by a dry method, lint from said exhausted air before the exhausted air reaches the preheater;

means for moving the preheater away from other elements of the system, for cleaning of the preheater; and

means, including a bypass damper, for routing said flow of exhausted air away from said second duct during the cool-down period.

4,326,345

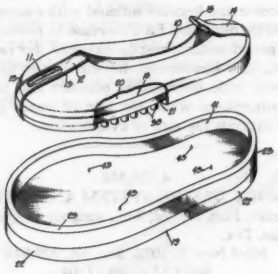
ARTICLE OF FOOTWEAR

Peter J. Sbicca, 2895 Lorain Rd., San Marino, Calif. 91108

Division of Ser. No. 609,395, Sep. 2, 1975, Pat. No. 3,987,510, and a continuation of Ser. No. 697,145, Jun. 17, 1976. This application Apr. 23, 1979, Ser. No. 32,166

Int. Cl.³ A43B *5/00*

U.S. Cl. 36—135 **12 Claims**



1. Footwear comprising an upper formed from a continuous ringlet shaped to snugly embrace the heel, toes and either side of the foot, the lower edge of said ringlet being embedded and inseparably bonded to a one-piece molded sole member of elastomeric material compounded to cure the take a set at room temperature while bonding the lower edge of said ringlet thereto, and the perimeter portion of said sole member in which the edge of said ringlet is embedded being substantially thicker than major other portions of said sole member inwardly of said perimeter portion.

4,326,346

CRANE FOR A TOWING SUCTION DEVICE FOR A DREDGING CRAFT

Nicolaas F. van Dee, Santpoort, Netherlands, assignor to B.V. Beheermaatschappij T. denBreejen van den Bout, Overveen, Netherlands

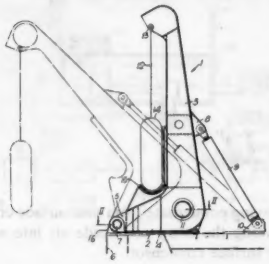
Filed Mar. 10, 1980, Ser. No. 128,389

Claims priority, application Netherlands, Mar. 11, 1979, 7901935

Int. Cl.³ E02F *3/90*

U.S. Cl. 37—72 **7 Claims**

1. A crane for a towing suction device of a dredging craft for displacing a movable part of the suction device between an inboard, rest position and an outboard, dredging position, said crane including: a generally L-shaped carrying member having a shorter leg that is substantially horizontal when said crane is in the rest position and a longer substantially vertical leg, said shorter leg resting on the deck of the dredging craft and having at its outboard end a pivot connection to the deck near the board of the craft with an axis extending in the longitudinal direction of the craft, said longer leg being formed as a closed tube shaped element; a winch and drive motor mounted within



the tube shaped element in the corner of the L-shaped carrying member; winch cables extending through said tube shaped element from said winch to the movable part of the suction device; and means for pivoting said carrying member about said pivot to move the towing suction device between the inboard and outboard positions.

4,326,347

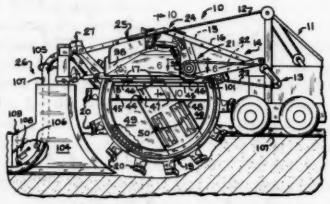
NARROW DITCH TRENCHER

Paul V. Ballinger, Findlay, Ohio

Continuation of Ser. No. 34,672, Apr. 30, 1979, abandoned. This application Jan. 29, 1981, Ser. No. 229,741

Int. Cl.³ E02F *5/08*

U.S. Cl. 37—94 **10 Claims**



1. A narrow ditch trencher comprising, in combination,

a rigid frame,

a trenching wheel supported for rotation about a horizontal axis,

means intermediate said frame and said trenching wheel for supporting said wheel for rotation about said axis,

a plurality of bucket assemblies disposed about said trenching wheel, said bucket assemblies having a radially extending spoke rigidly secured to said trenching wheel, and a curved plate rigidly secured to said spoke, said curved plate having side edges spaced from said trenching wheel and said spoke, said curved plate having a trailing portion disposed substantially tangentially to said axis and a leading portion disposed at an angle to said tangential trailing portion,

a pair of circular gear racks secured to said trenching wheel,

an annulus disposed on said trenching wheel intermediate said bucket assemblies and said gear racks and having a width approximately equal to the width of said curved plates,

generally planar spaced-apart sidewall members disposed within the lower portion of said trenching wheel, said sidewall members having curved marginal edges extend-

ing radially outwardly at least as far as said circular gear racks, and

a pair of spoil removal arms secured to said rigid frame and having spoil removing ends disposed adjacent said trenching wheel at distinct circumferential positions,

whereby rotation of said trenching wheel engages and lifts soil from below ground level.

4,326,348

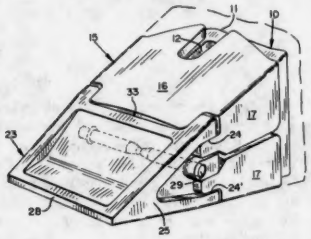
EXCAVATING TOOTH ASSEMBLY

Robert K. Emrich, Portland, Oreg., assignor to ESCO Corporation, Portland, Oreg.

Filed Jul. 30, 1980, Ser. No. 173,769

Int. Cl.³ E02F 9/28

U.S. Cl. 37—142 R **27 Claims**



1. A tooth assembly for earth working equipment comprising

an adapter having top, bottom and side surfaces and means at the rear end thereof for projecting the same forwardly from said equipment and point coupling means at the forward end for receiving a point attachable on said adapter by movement along a predetermined axis, said point coupling means terminating in a pair of spaced apart stabilizing surfaces arranged on opposite sides of said axis, said adapter also having mounting means for supporting a wear cap on said top surface to protect said adapter against wear from earth passing thereover,

a wear cap removably mounted on said adapter covering at least a portion of said top surface, said wear cap having at least one axially extending joint means,

a point removably coupled to said adapter and having a bit at the forward end thereof and the complement to said coupling means at the rear end thereof, said complement to said coupling means terminating in a pair of spaced apart stabilizing surfaces arranged on opposite sides of said axis, said point having forwardly extending sidewalls, a complement to said joint means in at least one sidewall adapted to receive said joint means whereby said joint means and complement thereto cooperate with said stabilizing surfaces in resisting the beam component of externally applied forces on said point, and

lock means releasably securing said point to said adapter.

4,326,349

GREETING CARD DISPLAY DEVICE

Georgia A. Daughtry, 1107 Cedar St., Elizabeth City, N.C. 27909

Filed Dec. 21, 1979, Ser. No. 106,103

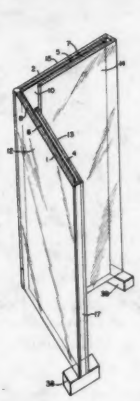
Int. Cl.³ A47G 1/06; G09F 1/00, 3/18, 7/02

U.S. Cl. 40—152.1 **3 Claims**

1. An article for displaying greeting cards having at least two leaves, comprising:

a. a first leaf support and first means for receiving one greeting card leaf;

b. a second leaf support and a second means for receiving a second greeting card leaf, said second leaf support having a frame means; and



c. separable connecting means connected to said first leaf support for connecting with said frame means of said second leaf support.

4,326,350

ALUMINUM FOIL LABEL FOR BOTTLES

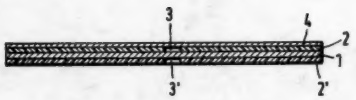
Dieter Roske, Hann.-Münden, Fed. Rep. of Germany, assignor to Haendler & Natermann GmbH, Hann.-Münden, Fed. Rep. of Germany

Filed May 27, 1980, Ser. No. 153,221

Claims priority, application Fed. Rep. of Germany, May 26, 1979, 2921402

Int. Cl.³ G09F 3/00

U.S. Cl. 40—310 **13 Claims**



1. In an aluminum foil label for bottles, which has on both sides a colorless or colored coating which is insoluble in an alkaline cleaning liquor said coating provided with mutually opposite weak areas.

4,326,351

DISPLAY DEVICES

Joseph R. Heywood, 118 Morgan St., Kingsgrove, New South Wales, and Leonard H. Ainsworth, 108 Dunning Ave., Rosebery, New South Wales, both of Australia

Filed Jun. 2, 1980, Ser. No. 155,752

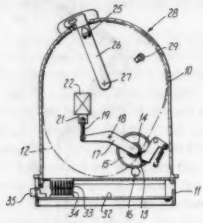
Claims priority, application Australia, Nov. 6, 1979, PD9145

Int. Cl.³ G09F 11/12, 11/18; A63B 71/00; G01D 9/00

U.S. Cl. 40—467 **13 Claims**

1. A display device for an amusement or game machine wherein a series of indicia on a movable member are viewed through a window in a housing of the machine comprising a housing member formed by walls enclosing a space, a base surrounding said housing, at least one window through a wall of said housing, at least one endless, flexible, closed loop tape disposed within said housing, a series of indicia on at least one surface of said tape, drive means for driving said tape around its closed loop path, means for supporting and guiding said tape past the inside of said window so that at least one of said indicia can be viewed therethrough, means for starting and

stopping said drive means, electronic sensing means for sensing the position of said tape with respect to its path of travel, and control means operatively associated with said sensing means



for controlling said starting and stopping means in response to said sensing means whereby said tape is stopped in a predetermined position with at least one of said indicia in said window.

4,326,352

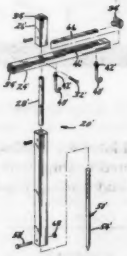
SIGN POST

Duane D. Barth, Burnsville, Minn., assignor to Heritage Products Intl., Inc., Burnsville, Minn.

Filed Dec. 6, 1979, Ser. No. 100,890

Int. Cl.[3] **G09F** *15/00;* **F16M** *13/00*

U.S. Cl. 40—607 **18 Claims**



1. A sign post for holding a sign above the surface of the ground comprising:

an elongated stake having a small cross-sectional dimension for easy insertion into the ground;

a post having a substantially larger cross-sectional dimension than said stake;

means for removably attaching said post to said stake, said attaching means holding said post in a vertically-disposed orientation when said stake is inserted into the ground;

a support member;

a guide member having an upper portion extending above said support member and a lower portion extending below said support member; and

a cap member fitted about the upper portion of said guide member;

said guide member for holding said post, said support member and said cap member together.

4,326,353

MAGAZINE CATCH RELEASE FOR A HAND FIREARM

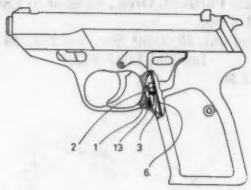
Walter Ludwig, Ulm, Fed. Rep. of Germany, and Franziska Schmid, deceased, late of Langenau, Fed. Rep. of Germany (by Hans Schmid, heir), assignors to Carl Walther GmbH, Ulm, Fed. Rep. of Germany

Filed Feb. 7, 1980, Ser. No. 119,407

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1979, 2905770

Int. Cl.[3] **F41C** *25/06*

U.S. Cl. 42—7 **8 Claims**



1. A device for retaining a magazine in a hand firearm comprising means on the firearm for releaseably locking a magazine within a butt of the firearm, and actuating means on both sides of the firearm and operatively connected to said locking means, said actuating means being actuable from either one of both sides of the firearm by the hand of the user holding the firearm whereby the user can unlock the magazine with either hand holding the firearm.

4,326,354

RECREATIONAL KIT FOR CONSTRUCTING OBJECTS

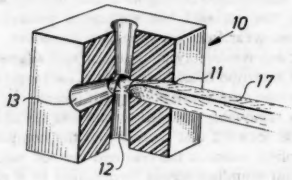
Carl E. Hagberg, Sandelsgaten 37, S-115 33 Stockholm, Sweden

Continuation of Ser. No. 888,645, Mar. 21, 1978, abandoned. This application Apr. 14, 1980, Ser. No. 140,309

Claims priority, application Sweden, Mar. 24, 1977, 7703359

Int. Cl.[3] **A63H** *33/10, 33/04;* **B25G** *3/28, 3/00*

U.S. Cl. 46—26 **39 Claims**



1. A kit for recreational purposes for the building of at least user designable objects comprising toy-like configurations having at least one geometrically selectable shape, said kit comprising:

a plurality of blocks having exterior surfaces, each of said exterior surfaces having at least an extreme outer surface portion, a central region circumscribed by said extreme outer surface portion; at least one aperture on the exterior surface of each of said blocks, said at least one aperture defining a hole, said hole having a substantially central longitudinal axis extending substantially immediately from said outer surface generally toward said central region, said hole having varying cross-sectional area which decreases from said exterior surface towards said central region progressively along at least a portion of the length of said longitudinal axis, and

a plurality of elongated elements being hand-breakable by the user into desired lengths, and formed of substantially a deformable material throughout and having ends which have a non-mating cross-section adapted to be insertable

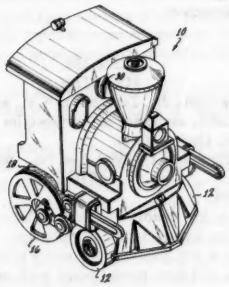
into the holes in said blocks at least for inter-connecting a selectable portion of said blocks one with the other, said hole having such a profile with respect to said cross-section of the elongated elements that a selectable end of each said elongated elements is compressibly grippable by deformation in and by a corresponding hole, at one of at least several locations along said portion of decreasing cross-sectional area of the hole.

4,326,355

TOY SIMULATING STEAM LOCOMOTIVE, AND WHISTLE

Saburo Watanabe, Gardena, Calif., assignor to Tomy Kogyo, Co., Inc., Tokyo, Japan

Filed Jan. 30, 1980, Ser. No. 116,904
Int. Cl.³ A63H *33/26;* G10K *5/00, 9/10*
U.S. Cl. 46—44 **16 Claims**



1. A toy steam locomotive which comprises:
a housing;
means for producing a sound simulating a steam locomotive mounted on said housing;
means for producing a sound simulating a steam locomotive whistle mounted on said housing;
means for producing a visual simulation of a fire in a steam locomotive firebox mounted on said housing, said latter means including at least one member mounted for relative movement on said housing, the movement of said member simulating the flickering movement of a flame;
power means operatively connected to said means for producing a sound simulating a steam locomotive, said means for producing a sound simulating a steam locomotive whistle, and said means for producing a visual simulation of a fire;
switch means connected to said power means for turning said power means off and on;
first control means operatively connected to said means for producing a sound simulating a steam locomotive whistle and capable of controlling said means for producing a sound simulating a steam locomotive whistle between an on position wherein said whistle sound occurs and an off position wherein said whistle sound does not occur;
second control means operatively connected to said means for producing a sound simulating a steam locomotive for modulation of said simulated steam locomotive sound .

3. A sound producing apparatus for a toy which comprises:
a resonator means located in said toy such that a portion of said resonator means is free to vibrate producing a sound audible outside of said toy;
an activator means located in said toy and including a power means for continuously activating said activator means;
a variable vibration means located in said toy and means associating it with said resonator means such that vibration can be transferred from said variable vibration means to said resonator means for producing said sound;
cycling means located in said toy and including means associating said cycling means with said power means whereby said power means moves said cycling means in a cyclic manner;
said variable vibration means attaching to said cycling means, said variable vibration means cyclically associating and disassociating with said activator means in response to said cyclic movement of said cycling means such that vibrations are induced in said variable vibration means when said variable vibration means is associated with said activator means and said vibrations are allowed to dissipate when said variable vibration means is disassociated from said activator means.

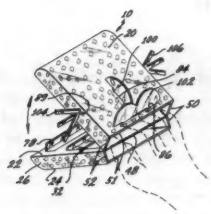
15. An apparatus for producing a whistling sound which comprises:
a chamber having an air inlet and air outlet, a fan means located in said chamber;
an independent whistle means associated with said air outlet of said chamber;
an inlet closure means associated with said air inlet and including a closure member capable of sealing said air inlet to ingress of air into said chamber, control means operatively connected to said closure member and capable of moving said closure member with respect to said chamber allowing air to ingress into said chamber and be propelled from said chamber by said fan means through said outlet into said whistle means;
said fan means comprising a disk rotatably mounted within the interior of said chamber and including a plurality of fan blades extending perpendicular to said disk from the outer perimeter of said disk toward the center of said disk;
said outlet of said chamber being located beyond the periphery of said disk, said inlet in said chamber being located directly over the central section of said disk;
said closure member comprising a flat plate hinged on said chamber and movable between a position wherein said flat plate is located over said inlet to a position wherein said flat plate is removed from said inlet.

4,326,356

CARDBOARD FOOD TRAY AND PUPPET DEVICE

Thomas A. Mason, Racine, Wis., assignor to Western Publishing Company, Inc., Racine, Wis.

Filed Sep. 15, 1980, Ser. No. 186,947
Int. Cl.³ A63H *3/14, 33/00;* B65D *5/20*
U.S. Cl. 46—154 **4 Claims**



1. A generally rectangular sheet of self-supporting material for forming, in a folded condition, a carrying tray convertible into a hand puppet, comprising:
at least one opening in said sheet for receiving a food item;
a first pair of parallel fold lines extending along a length of said sheet to form a first tray side portion flanked on one side by one edge of a top panel and on the other side by one edge of a bottom panel;
a second pair of parallel fold lines extending along a length of said sheet adjacent the other edge of said top panel to form a second tray side portion for cooperating with said first tray side portion in said folded condition to space apart said top panel from said bottom panel to form a tray cavity, each end of said first and second tray side portions being provided with an arcuate surface;

a hinge line extending across one of said panels, said hinge line substantially bisecting said one of said panels;

a perforated tear line provided on said sheet in colinear relationship with said hinge line and extending continuously from said hinge line to opposite edges of said sheet, whereby said hand puppet may be provided by separating said tray along said tear line and folding said tray about said hinge line;

cut lines in one of said panels and in at least one of said tray side portions for receiving decorative elements extending from said panels and said side portions;

a side retaining tab extending from one of said second pair of parallel fold lines, said side retaining tab being adapted to be engaged under the other edge of said bottom panel to secure said sheet in said folded condition;

a transverse fold line extending across the width of each panel adjacent each end thereof, a first end of each of said arcuate surfaces on said first tray side portion abutting an associated one of the transverse fold lines on said top panel and a second end of each of said arcuate surfaces on said first tray side portion abutting an associated one of the transverse fold lines on said bottom panel;

an end wall extending from each of said transverse fold lines;

a retaining slot provided in each of the end walls on one of said panels;

a retaining tab extending from each of the end walls on the other of said panels, each of said retaining tabs being provided with arcuate hook portions for retaining receipt by an associated one of said slots for closing the ends of said carrying tray when said sheet is in said folded condition; and

a set of simulated teeth provided on said top panel adjacent each of said end walls on said top panel, each set of said simulated teeth being formed by providing cut lines in said top panel, whereby each set of simulated teeth may be folded to a position approximately normal to the surface of said top panel.

4,326,357

MODEL LOCOMOTIVE SUSPENSION SYSTEM

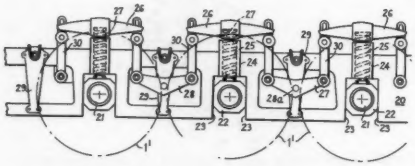
Christopher W. Shaw, Kirkbymoorside, England, assignor to Micro Metalsmiths Limited, N. Yorkshire, England

Filed Apr. 15, 1980, Ser. No. 140,613

Claims priority, application United Kingdom, Apr. 19, 1979, 13615/79

Int. Cl.³ A63H *19/02*

U.S. Cl. 46—217 **1 Claim**



1. In a model of a locomotive which includes a chassis, wheel axles mounted at parallel spaced positions along said chassis, and an equalized or compensated suspension system comprising means mounting said axles for generally vertically reciprocating movement relatively to said chassis, a set of leaf spring members arranged generally horizontally in spaced relation at a first level along each side of said chassis, a set of suspension lever members disposed between adjacent ones of said leaf spring members and arranged generally horizontally at a second level along each side of said chassis, at least one of said sets of leaf spring members and suspension lever members forming spanning members disposed in spanning relation with said wheel axles respectively, link means arranged generally vertically along each side of said chassis and interconnecting said leaf spring members with adjacent ones of said suspension lever members, holder means fixed to said chassis between each of said spanning members and its respective axle mounting means, each said holder means being open at upper and lower ends adjacent its respective spanning member and axle mounting means, and a pillar member vertically slidable in each said holder means and bearing at upper and lower ends on said respective spanning member and axle mounting means, whereby said suspension system supports said chassis on said wheel axles; means for facilitating small scale modelling of said suspension system with an appearance closely resembling the full size system and functioning similarly thereto, whereby to render said model a more precise reproduction of the full size locomotive, said means comprising said leaf spring members modelled as rigid dummy leaf springs, and said pillar members formed as compression coil springs, each said spanning member bearing on said upper end of its respective holder means for rocking movement thereon, having a recess adjacent said respective holder means in which is engaged the upper end of said coil spring, and being arranged to be movable in a generally vertical direction.

4,326,358

HYBRIDS

Robert H. Lawrence, Jr., Tarrytwon, N.Y., and Phillip E. Hill, Hollister, Calif., assignors to Agrigenetics Research Associates Limited, Denver, Colo.

Filed Jul. 17, 1980, Ser. No. 169,876

Int. Cl.³ A01G *1/00*

U.S. Cl. 47—58 **14 Claims**

1. A process for rapidly developing hybrids and commercially producing hybrid seeds, comprising:

(a) selecting a first parent plane and a second parent plant;

(b) crossing said first parent plant with said second parent plant to obtain original-parent-derived hybrids that are phenotypically uniform;

(c) cloning said first parent plant to produce a first cloned parental line; and

(d) crossing plants of said first cloned parental line with said second parent plant or with a second parental line produced therefrom to obtain hybrid seeds which yield hybrids that are phenotypically uniform, provided that when said second parent plant is heterozygous and a second parental line produced therefrom is used in the crossing of step (d), said second parental line must be produced by cloning.

4,326,359

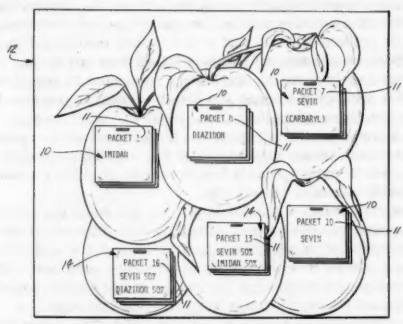
DEVICE AND PROCESS FOR FRUIT TREE INSECT CONTROL

Frank E. Tabacchi, 4531 Cass Elizabeth, Pontiac, Mich. 48054

Filed Aug. 28, 1980, Ser. No. 181,979

Int. Cl.³ A01G *1/00*

U.S. Cl. 47—58 **9 Claims**



1. A home gardener's method for fungus and insect control

for pome fruit trees for an entire season avoiding repetitious application and the development of an insecticide resistant strain of insects using a first water soluble insecticide, a second water soluble insecticide, a third water soluble insecticide and a water soluble fungicide comprising the steps of:

(a) mixing a pre-packaged amount of a first insecticide with a pre-determined amount of water to form an aqueous solution, and spraying a fruit tree with the aqueous solution when the tree leaf buds show green;

(b) mixing a pre-packaged amount of a water soluble fungicide with a pre-determined amount of water to form an aqueous solution thereof and spraying the fruit tree ten days after step (a).

(c) repeating the application of the aqueous fungicide solution of step (b) when the fruit buds begin to open;

(d) mixing a pre-packaged amount of a second water soluble insecticide with a pre-determined amount of water and spraying the tree after three-fourths of the petals have dropped;

(e) mixing a pre-packaged amount of the first water soluble insecticide with a pre-determined amount of water and spraying the tree approximately ten days following step (d);

(f) spraying the tree approximately ten days following step (e) when no rain is predicted using an aqueous solution prepared as in step (d);

(g) mixing a pre-packaged amount of a third water soluble insecticide with a pre-determined amount of water to form an aqueous solution and spraying the tree approximately ten days following step (b) when no rain is predicted;

(h) mixing a pre-measured amount of the second insecticide and the third insecticide in a pre-determined amount of water to form an aqueous solution and spraying the tree with the aqueous solution approximately ten days following step (g) when no rain is predicted;

(i) mixing a pre-measured amount of the first insecticide with a pre-determined amount of water to form an aqueous solution and spraying the tree with the aqueous solution approximately ten days following step (h) when no rain is predicted;

(j) mixing a pre-packaged amount of the third insecticide with a pre-determined amount of water to form an aqueous solution and spraying the tree with the aqueous solution approximately ten days following step (i) when no rain is predicted;

(k) mixing a pre-packaged amount of the second insecticide with a predetermined amount of water to form an aqueous solution and spraying the tree with the aqueous solution approximately ten days following step (j) when no rain is predicted; and

(l) mixing a pre-packaged amount of the third insecticide with a pre-determined amount of water to form an aqueous solution and spraying the tree with the aqueous solution ten days following step (k) when no rain is predicted.

4,326,360

SHUTTER SHIELDS (R) VERTICAL TRAVEL ET AL.

James D. Davidson, 67 Grantour Ct., Pontiac, Mich. 48055

Filed Aug. 7, 1979, Ser. No. 64,354

Int. Cl.[3] **E05B** *65/04*

U.S. Cl. 49—63 **4 Claims**

1. An improved insulated shutter shield device in combination with a glass area mounted in a building structure having upright walls, said glass area including a glass area frame, said shutter shield device having track means spaced inwardly of and parallel to the plane of said glass area means;

laminate insulative shutter shield means mounted in said track means for movement between positions located above said glass area means and in front thereof, to block off the entirety of said glass area means,

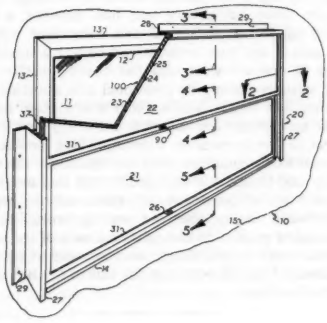
said laminate insulative shutter shield means including a frame movably supported in said track means and having an imperforate surface layer and an insulation material layer mounted side by side in the frame, said imperforate surface layer providing a surface against which is engaged with insulative material, said insulative material having little resistance against breakage when forces are applied in direction perpendicular to the plane thereof, said imperforate surface layer providing a protective barrier from the outside and a rigidification of said insulative material against the effects caused by forces applied from the outside in direction perpendicular to the plane thereof; and

seal means for effecting a seal around the periphery of said glass area means and between said glass area means and said insulated shutter shield means, thereby defining a sealed chamber,

wherein the improvement comprises:

means for mounting said track means in a parallel mode adjacent to the vertical side edges of said glass area frame means, spaced equadistant from the vertical center line of said glass area means, said track means being fastened to the building wall structural framing defining the building wall rough opening for receiving said glass area frame means;

means for mounting a horizontal header seal bar located above and at 90 degrees to said parallel vertical track means, said header seal bar is fastened to the building wall structural framing defined as the glass area rough opening header;



means for installing at least one stationary thermal shutter shield means in said vertical track means, closely fitted and sealed at said header seal bar, said stationary shutter shield means is maintained in a stationary mode in said track means, said maintaining means is a compressible expandable low friction slide means attached to the vertical sides of said insulated shutter shield device, compressed against said vertical track means, thereby preventing movement;

means for movably supporting at least one insulated shutter shield means in said vertical track means, said movable support means being compressible expandable low friction slide means, fastened to the vertical sides of said insulated shutter shield means and compressed against said vertical track means, maintaining said insulated shutter shield means equadistant around said device means vertical center line and in a stationary mode in any desired location in said vertical track means, said movable shutter shield means being manually movable to seal on said glass area sill means; and

means for sealing between said stationary shutter shield means and said movable shutter shield means in a closed mode maintaining said sealed chamber.

4,326,361

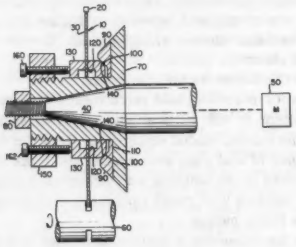
ADJUSTABLE HUB MOUNT FOR CIRCULAR SAW BLADE

William C. McGill, San Marcos, Calif., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 27, 1980, Ser. No. 163,513

Int. Cl.³ B24B *45/00*

U.S. Cl. 51—168 **1 Claim**



1. An adjustable hub for rotating saw comprising a hub member for surroundably engaging a motor spindle of a rotating saw such that the rotational axis of said hub member and motor spindle are coincident; a ring member having its rotational axis coincident with the rotational axis of the hub member and having a flat bearing surface at an angle of about 45° with the rotational axis of said hub member; a first flange member having its rotational axis coincident with the rotational axis of said hub member and having a rounded bearing surface in contact with said flat bearing surface; a second flange member having its rotational axis coincident with the rotational axis of the hub member and located adjacent said first flange member for engaging a circular saw between first and second flange member; a threaded ring member having its rotational axis coincident with the rotational axis of said hub member and threadably engaged to said hub member; at least two pairs of independently adjustable screws engaged with said threaded ring member and passing through said threaded ring member parallel to the rotational axis of the hub member to contact said second flange member, said adjustable screws being located equidistant from the axis of the hub member and from each other.

4,326,362

SHOT BLAST MACHINE

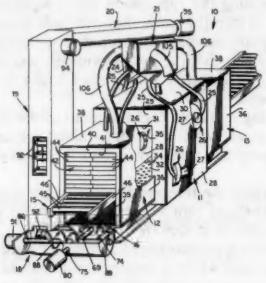
Virgil R. Williams, 2055 Webb Jin House Rd., Snellville, Ga. 30278, and James M. Williams, Jr., 2980 Payton Rd., NE., Atlanta, Ga. 30345

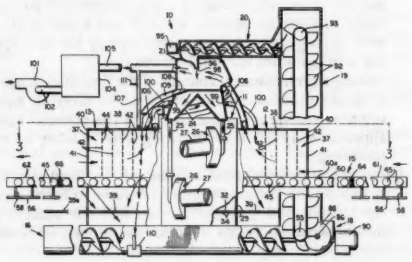
Filed Feb. 19, 1980, Ser. No. 122,366

Int. Cl.³ B24C *3/14, 9/00*

U.S. Cl. 51—417 **4 Claims**

1. A shot blast machine comprising a blast housing defining a blast chamber, aligned entrance and exit openings on opposite sides of said blast housing, an entrance vestibule housing in abutment with said blast housing and defining an entrance vestibule about the entrance opening of said blast housing, an exit vestibule housing in abutment with said blast housing and defining an exit vestibule about the exit opening of said blast housing, said vestibule housings each defining openings therein in alignment with the entrance and exit openings of said blast housing, shot propelling means mounted to said blast housing for propelling shot inwardly into said blast housing, shot hopper means positioned over said blast housing for delivering shot to said shot propelling means, an open surface conveyor means for moving objects to be blasted along a substantially rectilinear path through the openings of said entrance vestibule housing, said blast housing and said exit vestibule housing, shot recirculation apparatus for collecting the shot beneath said blast chamber and the entrance and exit vestibules and moving the shot toward and delivering the shot to said shot hopper means, said shot recirculation apparatus including a canopy extending along the length of and beneath said open surface conveyor means, a conveyor recess positioned below said canopy and extending parallel to said canopy and including walls sloped downwardly from about opposite sides of said canopy, a central auger conveyor extending along the length of said recess beneath said canopy, elevator means for receiving shot from said central auger conveyor and delivering shot to said shot hopper, a hopper overflow means for directing shot from said shot hopper downwardly through said open surface conveyor to said canopy, said canopy defining openings with said conveyor recess on opposite sides of said auger





screw at a level lower than the upper portion of the auger screw so that shot from said blast housing and said entrance and exit vestibule housings falls through the open surface conveyor means to and accumulates on and about the canopy of said auger conveyor and progressively feeds through said side openings to the lower portion of said auger screw, air circulation means comprising means for moving air from outside said shot blast machine inwardly through the openings of said vestibule housings and into the vestibule housings, and from the vestibule housings through air filter means to the atmosphere.

4,326,363

WAISTED ENVELOPE FOR TUBULAR BUILDING STRUCTURES

Fritz Leonhardt; Wolfhart Andrä; Wilhelm Zellner; Jörg Schlaich, and Gunter Mayr, all of Lenzhalde 16, D-7000 Stuttgart, Fed. Rep. of Germany

Filed Oct. 17, 1979, Ser. No. 85,702

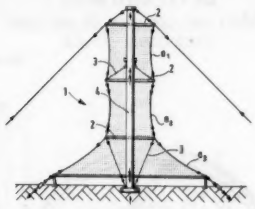
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1978, 2845194

Int. Cl.³ E04B *1/32*

U.S. Cl. 52—80 **5 Claims**

1. An envelope for building structures comprising at least one envelope part each characterized by a membrane of waisted shape, a system for supporting each envelope part comprising at least a pair of stiffening rings, each said envelope

part being pretensioned in substantially the axial direction and individually connected at both top and bottom locations to one of said stiffening rings, and means for supporting the uppermost stiffening ring thereby to take up the vertical component



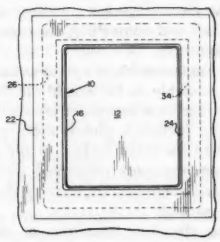
of a pulling force exerted by each envelope part, and wherein each envelope part is of a membrane design and material which in a pulled condition takes up pulling forces within its plane in all directions resulting in stabilization of the envelope part to a self-supporting condition.

4,326,364

IN-GROUND, INSULATED SWIMMING POOL CONSTRUCTION AND METHOD

Elmer R. Silvey, 1231 Dutton Rd., Eagle Point, Oreg. 97524

Filed Feb. 1, 1980, Ser. No. 117,544
Int. Cl.³ E02D *27/00*
U.S. Cl. 52—169.7 **14 Claims**



6. An in-ground swimming pool construction comprising:
an in-ground excavation including an excavation floor and sidewalls,
a swimming pool comprising cementious swimming pool side and bottom walls within said excavation but spaced inwardly of said excavation bottom and sidewalls to define spaces therebetween,
and a granular fill material filling said spaces to define a thermal insulating barrier between said excavation and pool bottom and sidewalls,
said granular fill material comprising volcanic cinders.

4,326,365

JOINT SYSTEM FOR WALLS, DOORS AND THE LIKE

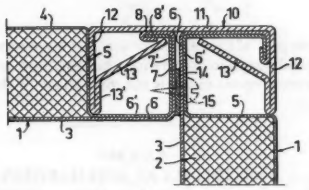
Gunnar Svensson, Jönköping, Sweden, assignor to AB Svenska Flaktfabriken, Nacka, Sweden

Continuation of Ser. No. 884,852, Mar. 9, 1978, abandoned. This application Jan. 24, 1980, Ser. No. 115,025
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1977, 207/77[URA]; Sweden, Mar. 10, 1977, 7702695
Int. Cl.³ E04C *2/38*; E04D *1/36*
U.S. Cl. 52—204 **12 Claims**

1. A joint system for first and second structural panels, each panel having spaced opposite side wall surfaces, at least one edge of each panel being constructed as a U-shaped edge, and a joint strip designed to cooperate with two adjacent edges of said first and second panels, said joint strip having a relatively flat U-shaped cross section which grips around said two adjacent U-shaped edges and locks these to one another, characterized in that

each U-shaped edge comprises a short side leg spanning between the opposite surfaces of the panel, a base extending outward at a right angle from one edge of said side leg, and a clamp leg spaced apart and parallel to the short side leg extending from said base and terminating in a projecting portion which is shorter than said base and bent in toward the short side leg, said short side leg, base and clamping leg being of approximately the same width, said projecting portion being located in a plane parallel to and inside the plane of the adjacent side wall surface by a predetermined distance, said short leg, base, clamp leg and projecting portion forming a generally square guideway between said clamp leg and said short side leg, said guideway extending along the length of said one edge of the panel and being open between said projecting portion and the short side leg to slidably receive the joint strip, and

each joint strip comprises



a body portion of a thickness corresponding to said predetermined distance, and a width corresponding to twice the width of said base,
arms extending perpendicular to said body and at the opposite edges thereof, said arms being approximately one-half of the width of the body and substantially the same width as said short side leg so that when the joint strip is in place within the guideway of one of said panel edges, the outer surface of the body portion is substantially coplanar with the adjacent side wall surface and one arm projects into the guideway alongside said side leg, and
locking strip means extending toward the central area of the body portion, the arm and locking strip means at each edge of the body portion being designed to slide longitudinally within the guideway of one U-shaped edge, each locking strip being of a width that the opposite edges of said locking strip are slidable longitudinally in the guideway between said short side leg and said clamp leg to retain the one panel edge in its location relative to the adjacent panel edge.

4,326,366

SUPPORT PLATE FOR GUIDING HEATING PIPES OF A FLOOR OR WALL HEATING SYSTEM

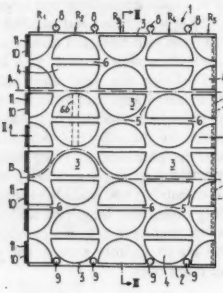
Beat Werner, Dietlikon, Switzerland, assignor to Thermowag AG, Zürich, Switzerland

Filed Dec. 17, 1979, Ser. No. 104,175
Claims priority, application Switzerland, Jan. 8, 1979, 123/79
Int. Cl.³ E04B *5/48*
U.S. Cl. 52—220 **17 Claims**

1. A support plate for guiding heating pipes of a floor or wall heating system, comprising:
a plate body having a plate top surface;
substantially cylindrically raised portions having a substantially flat top surface and being arranged at the plate top surface in mutually parallel rows;
each two neighboring raised portions forming therebetween an intermediate space;

all of said raised portions having substantially the same dimensions;

the raised portions of one row being offset with respect to the raised portions of both neighboring rows in the lengthwise direction of said rows;



at least part of the raised portions having a recess extending therethrough for receiving a heating pipe; and

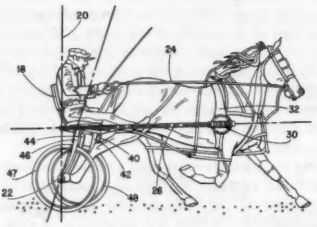
said recess opens towards the top surface of the raised portion.

4,326,367

RACING SULKY AND HARNESS

Richard J. Cashman, Columbus, Ohio, assignor to Produce Processors International Corporation, Columbus, Ohio

Filed Jun. 30, 1980, Ser. No. 164,138
Int. Cl.³ B62C *1/08*; B68B *3/00*
U.S. Cl. 54—2 **2 Claims**



1. An improved sulky and harness for attachment to a horse, said sulky being of the type having a pair of shafts extending forwardly on opposite sides of the horse, wherein the improvement comprises a pair of ball joints one extending inwardly from each of said shafts into attachment with said harness, each of said ball joints more particularly comprising a trough member connected to the ball portion of said joint by a connector means, said trough member having an end portion of its associated shaft seated in the trough member and a plurality of straps tightly surrounding said shaft and trough member for binding said shaft to said trough member, each of said shafts having a pair of spaced annular flanges attached to the shaft at opposite ends of said trough member to prevent longitudinal slippage of the shaft and wherein the socket portion of said ball joint comprises:

(a) a disk having a central depression for seating against said ball and interposed between said ball and said trough member, said disk having a central hole for receipt of and larger than said connector means; and

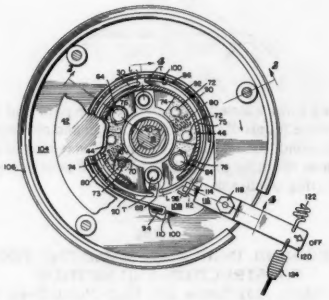
(b) a leather pocket interposed between said disk and said trough member and fastened to said harness to form a pocket for containing said disk and said ball.

4,326,368

CLUTCH AND BRAKE FOR ROTARY LAWN MOWER

Stephen J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.

Filed Jun. 12, 1980, Ser. No. 158,700
Int. Cl.³ A01D *69/10*
U.S. Cl. 56—11.3 **16 Claims**



1. A clutch-brake mechanism for mounting a lawn mower blade on a drive shaft and controlling the operation thereof, comprising in combination:

a rotary driving drum rotatable in a predetermined direction,

a driven carrier rotatable on the axis of the drum,

a pair of clutch-brake shoe assemblies pivotally mounted on said carrier and including clutch shoes positioned for engagement with the inner surface of the driving drum and brake drum segments positioned outward of said driving drum and connected for moving the clutch shoes to disengaged position,

means for biasing the shoe assemblies to clutch-engaged position,

and a brake band encircling said brake drum segments and engageable therewith to apply braking drag thereon and to mechanically move the segments in a direction to disengage the clutch shoes,

said shoes being pivotally mounted on the carrier at the leading ends thereof in the direction of rotation so as to cause the same to have a self-energizing action when engaged with the driving drum,

said driving drum being of steel, and each shoe being of compressed and sintered powdered iron and having an arcuate drum-engaging face of limited area on a radius greater than the radial distance from the drum axis to the shoe pivot axis and spaced rearward of such pivot axis and extending over an arcuate length approximately twice the angular length of such rearward spacing,

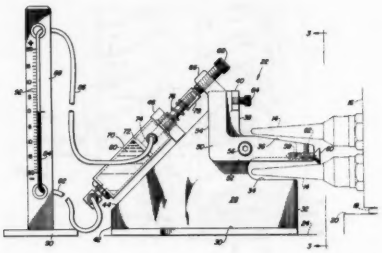
the brake drum segments having brake faces which extend in a trailing direction from the shoe pivot axis a substantial distance beyond said shoe faces and have leading portions which extend forward a substantial distance beyond said pivot axis, and said brake faces being disposed to lie at a distance from the axis of rotation which progressively increases from their leading ends to their trailing ends so as to be initially engaged at their trailing ends by the encircling brake band as such band is contracted against them and thereby to be swung inward so as to disengage the clutch shoes.

4,326,369

APPARATUS FOR CHECKING THE SPINDLE PLANE ON A COTTON HARVESTER

Merl S. Schillerstrom, Des Moines, and Robert A. Tufts, Bondurant, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 21, 1980, Ser. No. 170,407
Int. Cl.[3] A01D *46/16*
U.S. Cl. 56—41 15 Claims



1. For a cotton harvester which includes a rotatable picker drum carried in a picker unit housing and having a plurality of vertically adjustable upright spindle-supporting bars defining spaced columns of picker spindles, each column of spindles movable vertically with the corresponding bar as it is adjusted, each spindle moving in a generally horizontal path as the drum is rotated with corresponding spindles on adjacent bars moving in approximately the same path, a device for checking the relative height of the spindle supporting bars, comprising:

a support comprising a base adapted for support by the unit housing, and upright structure connected to the base;

means for fixing the base with respect to the unit housing with the upright structure located adjacent the path of a preselected set of spindles;

spindle sensing means movably supported by the upright structure in said path for sensing the vertical location of each said spindle on each bar relative to the housing as the picker drum is rotated;

stop means limiting the vertical movement of the spindle sensing means and maintaining the latter in substantial alignment with the spindles in the path when in a non-contacting relationship between adjacent columns of spindles for permitting each spindle in the path to move the spindle sensing means as the picker drum is rotated a complete revolution;

indicator means operably associated with the sensing means and responsive to the vertical movement of said sensing means for providing an indication of the relative vertical position of each of the preselected spindles.

4,326,370

ROTARY LAWN MOWER

Richard A. Thorud, Bloomington, Minn., assignor to The Toro Company, Minneapolis, Minn.

Division of Ser. No. 44,168, May 31, 1979, abandoned. This application Sep. 18, 1980, Ser. No. 188,293
Int. Cl.[3] A01D *35/26*
U.S. Cl. 56—202 10 Claims

9. A rotary lawn mower for cutting grass or the like, which comprises:

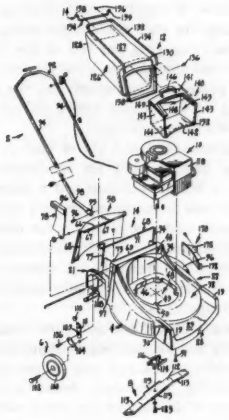
(a) a housing having a discharge port through which particles of cut grass may be discharged;

(b) means for movably supporting the housing;

(c) means for cutting grass at a predetermined height above the ground and for throwing the particles of grass through the discharge port;

(d) means releasably associated with the discharge port for receiving and retaining the cut grass particles discharged therethrough;

(e) wherein the housing includes a substantially U-shaped and upwardly facing seat adjacent the discharge port in which seat the receiving means is releasably received, the seat having upwardly extending side wings which extend along and outwardly from each side of the discharge port, wherein the side wings are sufficiently sized to intercept objects which may be accidentally thrown through the



discharge port when the receiving means is not associated therewith; and

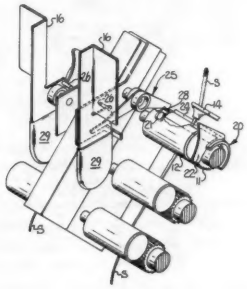
(f) pivotal door means on the housing for closing the discharge port when the receiving means is not associated thereiwith, wherein the door means is biased into a normally closed position.

4,326,371

SUPPLY STRAND INTERRUPTION MECHANISM FOR TEXTILE YARN SPINNING MACHINE

Brian Soar, Moorside, England, assignor to Parks-Cramer Company, Fitchburg, Mass.

Filed Mar. 3, 1980, Ser. No. 126,965
Int. Cl.[3] D01H *13/18*
U.S. Cl. 57—87 7 Claims



1. In the combination of

a textile yarn spinning machine having a plurality of drafting units arranged in a series, each drafting unit having a pair of back rolls, and a plurality of supply strand packages each normally delivering a corresponding supply strand to a corresponding back roll pair for drafting into a corresponding attenuated strand,

means movable along the spinning machine and having

detector means for monitoring production of attenuated strands and actuator means for responding to breakage of an attenuated strand, and

means mounted on the spinning machine and selectively remotely actuable by the actuator means for interrupting feeding of the corresponding supply strand,

an improvement in the interrupting means which facilitates reinstitution of supply strand feeding, the improvement comprising, for each such interrupting means:

wedge means engaging one roll of the corresponding back roll pair and movable relative thereto between an interruption position of insertion into the nip of said corresponding back roll pair and a normal running position withdrawn from said nip,

actuation means mounted above and overlying the corresponding drafting unit for movement relative thereto between a normal position and a tripped position in response to said actuator means and operatively interconnected with said wedge means for normally maintaining said wedge means in said withdrawn position and for responding to actuation by disconnecting from and thereby releasing said wedge means for movement into said interruption position,

said wedge means and said actuation means cooperating for entrapping and maintaining a supply strand in the nip of a corresponding back roll pair following breakage of the corresponding attenuated strand and accommodating restoration of drafting of the strand without necessitating rethreading of the drafting unit.

4,326,372

APPARATUS FOR BRAKING AND POSITIONING A SPINNING OR TWISTING SPINDLE

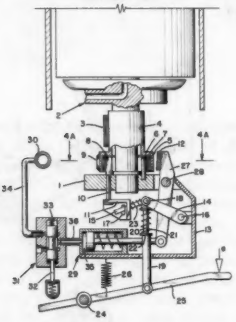
Siegfried Inger, Krefeld, Fed. Rep. of Germany, assignor to Palitex Project-Company GmbH, Krefeld, Fed. Rep. of Germany

Filed Sep. 24, 1980, Ser. No. 190,378

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1979, 2939862

Int. Cl.³ D01H 7/22

U.S. Cl. 57—88 **14 Claims**



1. An apparatus for braking and positioning a spindle rotor of a spinning or twisting spindle in a specific position comprising; a spindle having a rotary section, a spindle brake engageable with said spindle rotary section, spindle positioning means separate from said spindle brake, said rotary section of said spindle having a periphery, said positioning means including an additional braking surface extending over said periphery, an additional movable brake shoe, and means for urging braking engagement between said movable brake shoe and said additional braking surface.

4,326,373

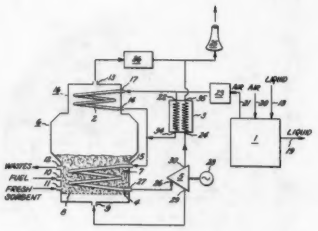
INTEGRATED GAS TURBINE POWER GENERATION SYSTEM AND PROCESS

Walter B. Giles, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 29, 1980, Ser. No. 154,233

Int. Cl.³ F02C 3/26

U.S. Cl. 60—39.02 **9 Claims**



1. An integrated gas turbine power generation system comprising:

(a) a fluidized bed combustor adapted for the combustion of carbonaceous fuel at nearly atmospheric pressure, said combustor including a bed of fluidizable particles, a freeboard region disposed to conduct effluent gases from said fluidizable bed out of said combustor, means for admitting said particles and carbonaceous fuel to said fluidizable bed, and an inlet for receiving a fluidizing and combustion gas at nearly atmospheric pressure;

(b) a gas expansion turbine having an inlet for receiving heated compressed gas, a first outlet in flow communication with said combustor inlet for discharging thereto a first quantity of expanded gas, and a second outlet for discharging a second quantity of expanded gas;

(c) a first air heater disposed within said combustor in contact with the particles in said fluidizable bed and having an outlet for discharging heated compressed gas in flow communication with said turbine inlet, and an inlet for receiving preheated compressed gas;

(d) a second air heater disposed within said combustor freeboard region and having an outlet for discharging preheated compressed gas in flow communication with said first air heater inlet, and an inlet for receiving compressed gas;

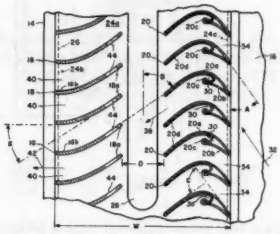
(e) a hydraulic compressor means for substantially isothermally compressing a flow of gas, said compressor means having a first outlet for discharging compressed gas in flow communication with said second air heater inlet, a second outlet for discharging liquid, a first inlet for a flow of gas to be compressed, and a second inlet for said liquid; and

(f) a heat exchanger means having a first inlet in flow communications with said second turbine outlet for receiving said second quantity of expanded gas, a second inlet in flow communication with said compressor means first outlet for receiving compressed gas, a first outlet for discharging said second quantity of expanded gas, a second outlet for discharging preheated compressed gas in flow communication with said first air heater inlet, and means within said heat exchanger means to enable the indirect transfer of heat from said second quantity of expanded gas to said compressed gas.

4,326,374
HIGH VELOCITY EXHAUST DIFFUSER AND WATER BAFFLE

Herbert R. Streb, Gig Harbor, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 18, 1980, Ser. No. 131,341
Int. Cl.³ F07C *7/00*
U.S. Cl. 60—39.09 P **9 Claims**



1. An exhaust gas diffuser and water baffle device for use in combination with a watercraft having an engine that produces high velocity exhaust gases which are carried through a substantially horizontal duct for overboard discharge, said device comprising:

inner and outer rows of elongated, parallel spaced vanes disposed in the flow path of said gases substantially immediately prior to said discharge;

frame means for supporting opposite ends of said vanes with a predetermined gap between said rows;

said vanes each being curved in section to present convex and concave sides, said vanes of said inner and said outer rows being curved in opposite directions such that the vanes of said inner row define first curved flow channels therebetween that effect a first predetermined angular bend in said flow path and the vanes of said outer row define second curved flow channels that effect a reverse, second predetermined angular bend in said flow path; and

said vanes of said inner row being characterized by hook shaped projections on the concave sides thereof defining grooves that have openings facing with the direction of flow of said gases;

whereby water propelled into said device in directions counter to flow of said gases with sufficient force to cross said gap is arrested in said grooves so as to prevent entry into said duct and engine.

4,326,375
GAS TURBINE-TRANSMISSION PLANT

Sven-Olof Kronogard, Karstorpsvägen 31, Lomma, Sweden (23400)

Division of Ser. No. 835,035, Sep. 20, 1977, Pat. No. 4,220,057. This application Feb. 22, 1980, Ser. No. 123,727
Claims priority, application Sweden, Sep. 24, 1976, 7610579
Int. Cl.³ F02C *3/10*
U.S. Cl. 60—39.16 S **5 Claims**

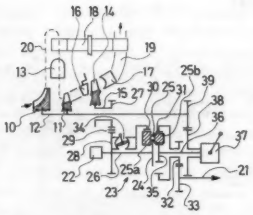
1. An automotive gas turbine-transmission plant comprising a compressor, a first turbine driving the same, at least one power turbine, as well as conventional auxiliaries,

(A) said first turbine being undersized with respect to the power consumption of the compressor during normal operation,

(B) stepped planetary gearing interconnecting said first and said at least one power turbine and including a planet carrier supporting a set of stepped planet gear wheels, a planet gear wheel having a small diameter at one end thereof and a planet gear wheel having a big diameter at the other end and further including one sun wheel, as well as at least one ring wheel meshing with said set of planet gear wheels,

(C) first means to transfer power input from said at least one power turbine to said gearing,

(D) second means to extract power from the gearing to an output shaft,



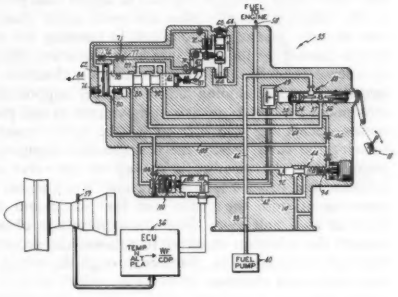
(E) third means for continuously changing the gear ratio between input and output at the gearing, said third means including an infinitely variable transmission acting together with either of said first or second means, and

(F) fourth means including a variable transmission to extract power for augmenting said first turbine from said gearing.

4,326,376
GOVERNORLESS GAS TURBINE FUEL CONTROL

Charles F. Stearns, East Longmeadow, Mass.; David L. Chapski, West Suffield, and Kenneth F. Vosseller, Enfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 23, 1979, Ser. No. 69,141
Int. Cl.³ F02C *9/04*
U.S. Cl. 60—39.28 R **4 Claims**



1. A fuel control for controlling fuel flow to a gas turbine engine in response to different engine power settings, comprising:

three parallel fuel flow circuits between a common fuel input port and a common fuel output port, and

means for maintaining constant fuel pressure between said input and output ports,

a first of said circuits including means providing a minimum fuel flow to the engine at a preselected minimum power setting, corresponding to a minimum engine operating level, said minimum flow decreasing in an inverse relationship to power setting,

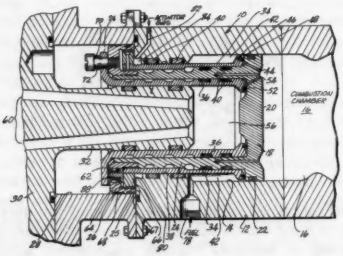
a second of said circuits including means providing fuel flow as a function of engine compressor discharge pressure,

a third of said circuits including means for providing fuel flow which increases in direct relationship to the power setting and is a function of compressor discharge pressure.

4,326,377
INJECTION SHUT-OFF VALVE FOR REGENERATIVE INJECTION

Vance W. Jaqua, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 18, 1980, Ser. No. 113,432
Int. Cl.[3] F02K 9/52
U.S. Cl. 60—247 8 Claims



1. A regenerative fuel injection system for injecting propellant into the combustion chamber of a fluid-fueled rocket engine, comprising:

means forming a cylindrical passage closed at one end and adapted to open into the combustion chamber at the other end; a piston movable in the cylindrical passage; the piston and closed end of the passage forming an injection chamber; a portion of the piston extending through an opening in the closed end of the passage, said portion reducing the effective area of the piston in the injection chamber relative to the effective area of the piston in the combustion chamber; means forming an orifice connecting the injection chamber to the combustion chamber; valve means for controlling fluid flow through the orifice; means holding the valve means closed in response to higher fluid pressure in the injection chamber than the combustion chamber; and actuator means for momentarily opening the valve means against the fluid pressure in the injection chamber to release propellant into the combustion chamber, said actuator means including a first member supported for movement parallel to the axis of movement of said piston, means connecting said member to the valve means for opening the valve means, the first member engaging the piston when the member is moved to the valve open position, and drive means forcing said first member into engagement with the piston and the piston and drive member as a unit away from the combustion chamber toward the injection chamber to squeeze the propellant fluid out of the injection chamber through the orifice into the combustion chamber.

4,326,378
FILTER FOR AN INTERNAL COMBUSTION ENGINE HAVING REJUVENATION CAPABILITIES

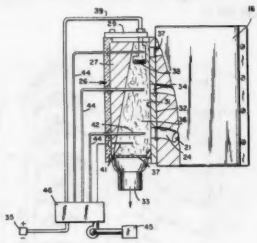
William M. Sweeney, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 31, 1980, Ser. No. 117,324
Int. Cl.[3] F01N 3/02
U.S. Cl. 60—311 7 Claims

1. Filter (26) for an internal combustion engine (10) having at least one cylinder (11) which encloses a combustion chamber (17), the latter having intake and exhaust valves (18) communicated therewith, the engine having at least one exhaust valve port (34) through which a hot exhaust gas stream is passed carrying combustible particles,

a casing (27) defining an elongated reaction chamber (31) having a progressively larger cross-section and having an inlet which communicates with said at least one exhaust gas port (34) to receive said exhaust gas stream therefrom, and said progressively larger reaction chamber (31) having an exhaust gas port (33) at the larger end thereof,

a filter bed (36) disposed in said reaction chamber (31) positioned to contact said hot exhaust gas stream and thereby retain said combustible particles from the exhaust gas stream while passing the latter therethrough,



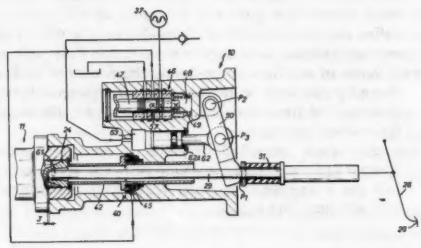
injector means (42) communicated with a source of a gaseous coolant (45), and having at least one nozzle disposed within said filter bed (36),

temperature control means (46) communicated with said injector means (42) and with said source of gaseous coolant (45), and being operable to regulate a flow of gaseous coolant into said filter bed (36).

4,326,379
HYDRAULIC CONTROL DEVICE FOR A MOTOR VEHICLE BRAKING CIRCUIT

Jean L. R. Dauvergne, Fosses, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Nov. 6, 1979, Ser. No. 92,420
Int. Cl.[3] B60T 13/20
U.S. Cl. 60—550 16 Claims



1. A hydraulic control device for a motor vehicle brake system having at least one hydraulic brake circuit, said control device comprising a master cylinder having at least one chamber connected to said brake circuit and a master piston for controlling the pressure in said one chamber under the action of a pedal, an auxiliary hydraulic circuit having a source of pressure, a hydraulic cylinder and piston unit including a piston for cooperating with said master piston for depressing the latter, distributor means for feeding auxiliary hydraulic pressure from said source to said cylinder and piston unit, said distributor means having a slide valve which is subjected to two opposing forces, one of the opposing forces being developed by the auxiliary hydraulic pressure and the other opposing force being developed by the action of the pedal through force transmitting means between said pedal and said slide valve including elastic means that are stressed by braking movement of the pedal for simulating pedal movement, and manual back-up means operable in response to said pedal for controlling said master cylinder in the event of a failure of said auxiliary circuit, said control device having a movable member

restrained against movement by said auxiliary hydraulic pressure and associated with said force transmitting means to cause said force transmitting means to stress said elastic means, said movable member being freed for movement in response to a failure of the auxiliary hydraulic pressure to relieve the stress in said elastic means, said manual back-up means, said movable member and said slide valve acting respectively along three separate and parallel axes.

4,326,380

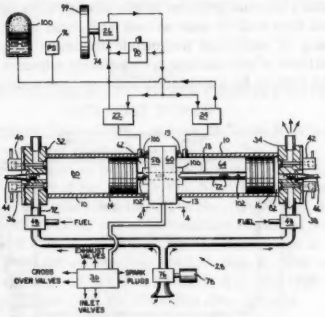
HYDRAULIC ENGINE

Peter A. Rittmaster, 1420 N. Lake Shore Dr., Apt. 3A, Chicago, and John L. Booth, 3905 Tower Dr., Richton Park, both of Ill.

Filed Jan. 9, 1980, Ser. No. 110,771

Int. Cl.[3] **F02B** *71/04;* **F04B** *17/00*

U.S. Cl. 60—595 **11 Claims**



1. An engine, comprising:

(a) at least one cylinder;

(b) two pistons fitting within said cylinder, each piston having two faces;

(c) rod means for connecting together said pistons, said connecting rod means joining together the first faces of said pistons, each second face of said pistons being directed outwardly towards one end of said cylinder;

(d) two cylinder heads, each head closing off an open end of said cylinder, said second face of said pistons being directed toward the inside of said cylinder heads, said second faces and said cylinder heads defining two combustion chambers;

(e) valve means, associated with each cylinder head, for directing a combustible mixture of fuel and air into said combustion chambers and for exhausting combustion gases from each of said chambers;

(f) ignition means associated with each cylinder head, for igniting said combustible mixture within said combustion chamber;

(g) plate means, interposed along said connecting rod means and cooperating with said cylinder for forming two pressurization chambers, said connecting rod means passing through said plate means, each of said pressurization chambers being defined by the space within said cylinder between said plate means and the first face of the associated piston, each pressurization chamber being joined to the exterior of said cylinder by a flow port in said cylinder wall, said plate means defining a pressure seal between said connecting rod means and the adjacent pressurization chambers, each of said pressurization chambers being filled with hydraulic fluid;

(h) control means for timing and for operating said valve means and said ignition means to reciprocate said pistons within said cylinder in a continuous cycle, said control means including proximity sensor means responding to the axial position of said connecting rod means relative to said plate means;

(i) cross-over means, joining together the fluid within said pressurization chambers via said flow ports in said cylinder wall, for sequentially directing fluid under pressure from one of said pressurization chambers to the other of said pressurization chambers, said cross-over means being operated by said control means responding to the axial position of said connecting rod means relative to said plate means;

(j) motor means, utilizing the fluid passing between said pressurization chambers and through said cross-over means, for driving a shaft in rotation, said cross-over means directing fluid through said motor means to keep said shaft rotating in the same direction, and

(k) said connecting rod means being fabricated from a non-ferrous material and having a pluraity of non-contact embedded ferrous inserts angularly positioned along the length of said rod for signalling the position of said connecting rod means to the proximity sensor means of said control means to define the axial position of said connecting rod means relative to said plate means.

4,326,381

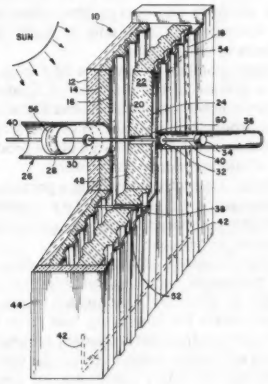
SOLAR ENGINE

Ronald N. Jensen, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 22, 1979, Ser. No. 51,275

Int. Cl.[3] **F03G** *7/02*

U.S. Cl. 60—641.14 **11 Claims**



1. A solar engine comprising:

solar engine housing means containing a working fluid;

said engine housing means having a reaction surface housing means and a displacer housing means;

said displacer housing means including therein an absorber plate and a cooling plate;

displacer means pivotally disposed within said displacer housing means;

said displacer means adapted to alternately insulate said absorber plate and cooling plate from said working fluid;

said reaction surface housing means communicating with said displacer housing means;

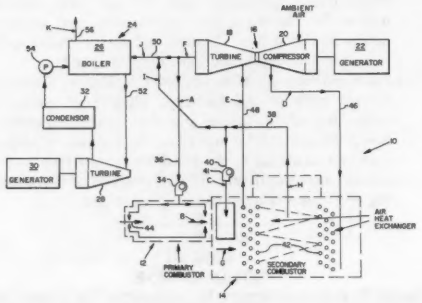
said reaction surface means slidably disposed within said reaction surface housing means and engaging and pivoting said displacer means;

said working fluid alternately being directly heated in said housing means by solar energy radiated through said absorber plate and cooled by said cooling plate through the movement of said displacer means to reciprocate said reaction surface means and produce work.

4,326,382
POWER PLANT

Andrew B. Baardson, Black Butte Ranch, Sisters, Oreg. 97759, assignor to E. H. Robbins, Eugene and Andrew B. Baardson, Sisters, both of, Oreg.

Filed Oct. 24, 1980, Ser. No. 200,543
Int. Cl.³ F01K *23/04*
U.S. Cl. 60—655 **19 Claims**



1. A power plant system comprising:

compressor means adapted to take in and compress air;

energy absorption means for taking in energy in the form of hot air, for using a portion of the energy, and for discharging the remainder;

a primary combustor having a first inlet for receiving exhaust air from said energy absorption means, a second inlet for receiving fuel, and an outlet for discharge of products of combustion;

a secondary combustor having a first inlet for receiving at least a portion of the products of combustion from said primary combustor, a second inlet for receiving a portion of the products of combustion of said secondary combustor, and an outlet for discharge of the products of combustion of said secondary combustor;

first conduit means for conveying a portion of the products of combustion of said secondary combustor from said secondary combustor outlet to said second inlet of said secondary combustor; and

an air heat exchanger within said secondary combustor, said heat exchanger including an inlet for receiving compressed air from said compressor means, heat exchange surface means for conveying heat from the products of combustion within said secondary combustor to the compressed air, and an outlet to direct the compressed, hot air out of said secondary combustor for passage to said energy absorption means.

4,326,383
COMPACT THERMOELECTRIC REFRIGERATOR

Kingstone L. H. Reed, and Ian Hatcher, both of Barrie, Canada, assignors to Koolatron Industries, Ltd., Barrie, Canada

Filed Aug. 4, 1980, Ser. No. 174,859
Int. Cl.³ F25B *21/02*; F25D *3/08*
U.S. Cl. 62—3 **7 Claims**

1. A portable thermoelectric refrigerator comprising in combination:

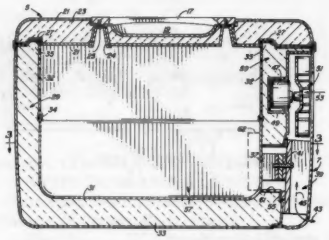
a. an insulated housing having a bottom, front and rear walls, and first and second end walls bounding a storage compartment, said thermoelectric refrigerator also including an openable cover for covering the top of said storage compartment;

b. a thermally conductive metal liner covering only the bottom of said storage compartment and the lower portions of said front, rear, and first and second end walls of said storage compartment;

c. a thermally conductive block extending through said first end wall and thermally contacting said thermally conductive metal liner;

d. a thermoelectric module thermally contacting said thermally conductive block;

e. an external heat exchanger located in a region on the opposite side of said first end wall from said storage compartment for thermally contacting said thermoelectric module, said external heat exchanger including a base of thermally conductive metal and a plurality of closely spaced parallel fins extending substantially perpendicularly from said base, each of said fins having a length that is substantially greater than a width thereof, said base and said fins being oriented vertically relative to the bottom of said thermoelectric refrigerator, said thermoelectric means removing heat from said thermally conductive metal liner, said thermally conductive liner having a thickness that causes said thermally conductive liner to produce a thermal gradient in said storage compartment from said first wall to said second wall, said thermal gradient being of sufficient magnitude to cause temperatures in portions of said storage compartment adjacent to said first end wall to be a predetermined amount colder than temperatures in portions of said storage compartment adjacent to said second end wall;



f. centrifugal fan means disposed directly above said external heat exchanger for drawing air from outside of said thermoelectric refrigerator into an elevated air inlet and forcing substantially all of that air between said fins, said centrifugal fan means including a circular plate mounted on a shaft of a fan motor and a plurality of vanes extending from a major surface of said circular plate;

g. a shroud element surrounding the upper portion of said centrifugal fan means and extending to fins on opposed sides, respectively, of said external heat exchanger; and

h. an end panel having said air inlet therein adjacent to said centrifugal fan means and also having an air outlet at the bottom edge of said end panel, said end panel and the outer surface of said first end wall cooperating with said shroud element to enclose said centrifugal fan means and said external heat exchanger to cause substantially all air drawn into said elevated air inlet by said centrifugal fan means to be forced to flow between various ones of said fins from the top of said external heat exchanger to the bottom thereof, said first end wall including a recess in the outer surface thereof for receiving the fan motor.

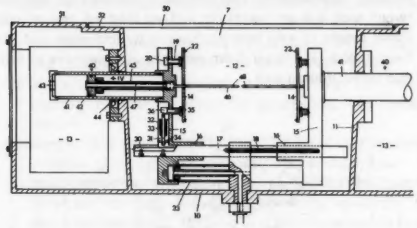
4,326,384
METHOD FOR COOLING BLOCKS OF HOT POROUS MATERIAL

William J. C. Pipe, and John B. Gray, both of Studholme St., Morrinsville, New Zealand

Division of Ser. No. 24,191, Mar. 27, 1979. This application Nov. 14, 1980, Ser. No. 206,843
Int. Cl.³ F25D *25/00*
U.S. Cl. 62—62 **6 Claims**

1. A method of cooling a block of porous material comprising inserting said block into a chamber, subjecting the chamber to air pressure less than that of the ambient air and inserting

means into the said block to induce a flow of cooling air through the interior of the block to the said chamber, whereby



the lower pressure in the chamber causes the cooling air to flow inwardly through the means inserted in the block for cooling the block.

4,326,385

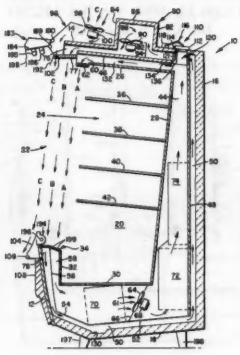
REFRIGERATED MERCHANDISER CABINET WITH AIR DEFROST PORTS

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Continuation-in-part of Ser. No. 8,927, Feb. 2, 1979, and a continuation-in-part of Ser. No. 25,473, Mar. 30, 1979, Pat. No. 4,245,482, and a continuation-in-part of Ser. No. 58,916, Jul. 19, 1979, Pat. No. 4,242,882, and a continuation-in-part of Ser. No. 101,069, Dec. 7, 1979, Pat. No. 4,265,090, and a continuation-in-part of Ser. No. 184,033, Sep. 4, 1980, and a continuation-in-part of Ser. No. 180,573, Aug. 25, 1980. This application Oct. 31, 1980, Ser. No. 202,626

Int. Cl.³ F25D *21/12*; A47F *3/04*

U.S. Cl. 62—82 **41 Claims**



38. A method of operating an open front display cabinet having top, bottom, side and end walls defining a display space and having apertures in at least two walls thereof for communicating ambient outside air into said cabinet, the aperture means comprising an access opening for permitting products to be moved into and out of said display space and at least one air outlet port, at least one air conduit positioned about the display space for enabling circulation of a primary air band and the air conduit having an outlet opening and an inlet opening at opposite ends thereof so that air leaving the outlet opening is directed across the access opening and received into the inlet opening, an air moving means for propelling said primary air band through the air conduit during a refrigeration cycle and for propelling ambient air through the air conduit during a defrost cycle, and refrigeration means arranged within the air conduit for selective operation in a refrigeration and in a defrost cycle, gate means selectively operative to close the air outlet port during the refrigeration cycle of operation and for opening the outlet port during a defrost cycle, and a baffle plate for blocking the passage of air in the air conduit during a defrost cycle of operation; said method comprising the steps of:

circulating a refrigerated primary air band in the air conduit during a refrigeration cycle of operation in which the gate means is closed over the air outlet port, terminating operation of the refrigeration means to initiate the defrost cycle of operation, thereafter opening the gate means and causing the baffle plate to move into blocking position within the air conduit, and propelling air within the air conduit across the refrigeration means, expelling the air through the air outlet port in order to defrost the refrigeration means, at the termination of the defrost cycle of operation, closing the gate means over the air outlet port and commencing operation of the refrigeration means, and circulating the air band in the same direction in both the refrigeration and the defrost cycles of operation.

4,326,386

TEMPERATURE CONTROL CIRCUIT FOR AUTOMOBILE AIR-CONDITIONING SYSTEM

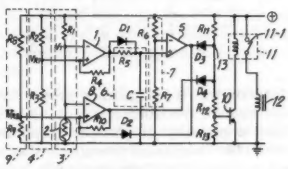
Yasushi Tamura, Ojima, Japan, assignor to Sankyo Electric Company Limited, Isesaki, Japan

Filed Sep. 18, 1980, Ser. No. 188,552

Claims priority, application Japan, Sep. 18, 1979, 54-118790; Nov. 16, 1979, 54-149312

Int. Cl.³ F25D *21/00*; F25B *1/00*

U.S. Cl. 62—150 **3 Claims**



1. In a temperature control circuit of an automobile air-conditioning system which has a refrigerating system including a refrigerant compressor and a refrigerant evaporator, a blower system for blowing air into the room of the automobile through said evaporator, and the temperature control circuit for controlling the operation of said refrigerant compressor in response to the temperature detected, the improvement which comprises:

first temperature detecting means for detecting the temperature of the air blown into the automobile room as an electric signal;

first reference signal source means for generating a predetermined reference signal equal to the output signal of said first temperature detecting means corresponding to a predetermined first temperature;

first comparing means for comparing the output from said first temperature detecting means with said first reference signal and providing a first output at a time when the detected temperature is higher than said first temperature and a second output at a time when the detected temperature is lower than said first temperature;

delay means for delaying said second output by a predetermined time period;

means coupled with the output of said delay means for generating a signal for stopping the operation of said refrigerant compressor;

means coupled with the output of said stop-signal generating means and with the output of said first temperature detecting means and maintaining an output signal for stopping the operation of said refrigerant compressor from the reception of the stop signal from said stop-signal generating means until a time when a predetermined second

temperature higher than said first temperature is detected by said first temperature detecting means; and

means for controlling the operation of compressor driving means and coupled with the output of said stop-signal maintaining means to thereby stop the operation of said compressor during a time period when said stop signal is present at the output of said stop-signal maintaining means.

4,326,387

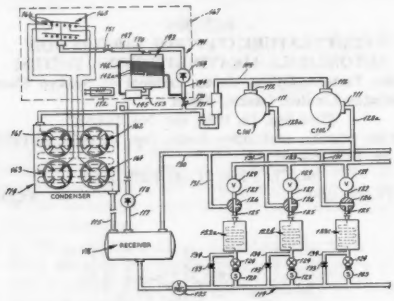
FLUIDIC TIME DELAY SYSTEM

Donald E. Friedman, Creve Coeur, Mo., assignor to Hussmann Refrigerator Co., Bridgeton, Mo.

Continuation-in-part of Ser. No. 892,777, Apr. 3, 1978, Pat. No. 4,184,341. This application Dec. 3, 1979, Ser. No. 95,972

Int. Cl.³ F25B *39/04, 1/00*

U.S. Cl. 62—184 **11 Claims**



1. In combination with a refrigeration system having multiple compressor means and condenser means including multiple condenser fans; a plurality of pressure responsive control switch means to effect sequential operations of at least one of said compressor means and said condenser fans in said refrigeration system, and a fluidic time delay system for operating said switch means in response to the fluid pressure at a predetermined location in said refrigeration system, said time delay system being disposed between the predetermined location and the control switch means and comprising unidirectional flow means and flow restrictor means in parallel by-pass relation with each other, said unidirectional means providing substantially unrestricted pressure equalization in one direction between said predetermined location and said control switch means, and said restrictor means restricting pressure communication between said predetermined location and said control switch means in the opposite direction, whereby increases and decreases in the fluid pressure at said predetermined location will be immediately equalized in said control switch means in one direction of pressure change and will be delayed in the other direction of pressure change.

4,326,388

DUAL OPEN CYCLE HEAT PUMP AND ENGINE

Richard McFee, R.D. #1, Union Springs, N.Y. 13160

Filed May 5, 1980, Ser. No. 146,600

Int. Cl.³ F25B *13/00*

U.S. Cl. 62—324.6 **16 Claims**

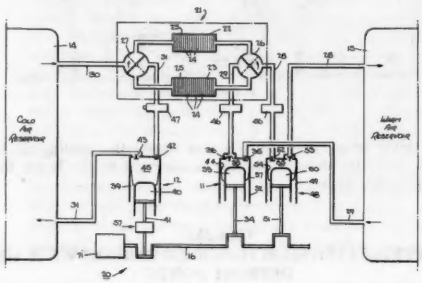
1. A heat pump comprising:

a cold air reservoir for storing air at a first temperature and pressure;

a hot air reservoir for storing air at a second temperature greater than said first temperature and at a pressure equal to said first pressure;

a heat exchanger having a pair of regenerators therein for conducting separate flows of air therein between said reservoirs and a pair of valve means for alternately connecting each of said regenerators to said reservoirs to alternately convey a flow of cold air from said cold air reservoir to said hot air reservoir and a flow of hot air from said hot air reservoir to said cold air reservoir;

a positive displacement compressor connected to and between said hot air reservoir and an inlet of one of said valve means of said heat exchanger to compress and deliver a flow of hot air from said hot air reservoir to said one valve means; and



a positive displacement expander connected to and between an outlet of the other valve means of said heat exchanger and said cold air reservoir to expand and deliver a flow of expanded air from said other valve means to said cold air reservoir.

4,326,389

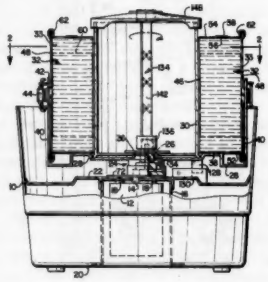
FROZEN DESSERT MAKER

Edmund C. Frost, 885 D Rever Village Ct., Centerville, Ohio 45459

Filed Apr. 22, 1980, Ser. No. 142,797

Int. Cl.³ A73G *9/00*

U.S. Cl. 62—342 **13 Claims**



10. A frozen dessert maker comprising:

a motor having a rotatable output shaft;

a drive train attached to said output shaft and having a second shaft parallel to and off-set from said output shaft whereby rotation of said output shaft causes said second shaft to orbit about the output shaft;

a cylindrical can having a central axis coaxial with said second shaft and rotatably mounted thereon;

a dasher rigidly mounted on said second shaft within said can;

a plurality of coolant packs for containing a coolant slurry, each having an inner concave face and an outer convex face and being positioned concentrically about said can such that said inner concave face of each said pack matingly engages a portion of said can;

a plurality of vanes attached to said inner concave face and

extending toward said outer convex face of each said pack;

means extending about said packs adjacent said outer convex faces thereof for clamping said packs to said can;

a platform rotatably mounted on said drive train in supporting relation with said can and said coolant packs;

a plurality of arms extending upwardly from the outer periphery of said platform for supporting said clamping means;

an upper stud extending downwardly from said platform in radially offset relation with said output shaft; and

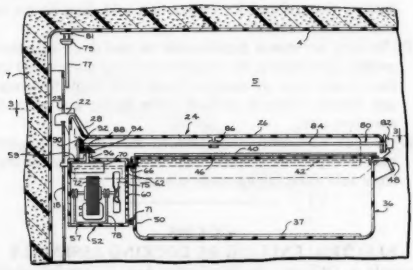
a basin rigidly positioned between said motor and said platform and having a lower stud extending upwardly therefrom and positioned thereon to act as a bearing surface for said upper stud such that rotation of said second shaft about said output shaft imparts a circular movement to said can and coolant packs about said output shaft with a reciprocal rotational movement superimposed thereon.

4,326,390

APPARATUS AND METHOD FOR THAWING FROZEN FOOD

Robert B. Brooks, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sep. 18, 1980, Ser. No. 188,420
Int. Cl.³ F25D *25/02*
U.S. Cl. 62—382 **8 Claims**



1. For use in a refrigerator appliance having a storage compartment maintained at a temperature between 33°–55° F., apparatus for thawing a frozen food load comprising:

a separate container located within the storage compartment for receiving a frozen food load to be thawed, said container and storage compartment having cooperating means to removably secure the container within the storage compartment;

an electric fan in air flow communication with the interior of the container; and

manually settable timer means for initially energizing and then deenergizing the fan after a predetermined period of operating time;

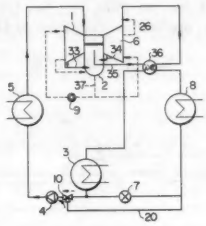
whereby the frozen food load may be thawed and allowed to remain in said container subsequent to thawing, the temperature within said container being substantially at the temperature of the storage compartment thus preventing spoilage of the thawed food.

4,326,391

RANKINE-CYCLE-ENGINE-DRIVEN COOLING-AND-HEATING SYSTEM

Eiji Sato, Shimoinayoshi; Nobukatsu Arai, Ushikumachi; Hideki Tanaka, Shimoinayoshi; Toshihiko Fukushima, Shimoinayoshi, and Tadakatsu Nakajima, Shimoinayoshi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 25, 1980, Ser. No. 180,638
Claims priority, application Japan, Aug. 24, 1979, 54-107264
Int. Cl.³ F25D *9/00*
U.S. Cl. 62—402 **6 Claims**



1. A Rankine-cycle-engine-driven cooling-and-heating system comprising

a scroll type expander including a stationary scroll having an end plate, a spiral coiled lap extended in parallel

with the axis of said end plate, an inlet for a working fluid, and an outlet for said working fluid; a swirling or rotating scroll having an end plate, and a spiral coiled lap extended in parallel

with the axis of said end plate and in mating relationship with said spiral coiled lap of said stationary scroll;

a rotary shaft carrying said swirling or rotating scroll;

a self-rotation preventive means for preventing the self-rotation of said swirling or rotating scroll, and

a housing joined to said stationary scroll; a scroll type compressor including

a stationary scroll having

an end plate,

a spiral coiled lap extended in parallel with the axis of said end plate, and

an inlet and an outlet;

a swirling or rotating scroll having

an end plate, and

a spiral coiled lap extended in parallel with the axis of said end plate and in mating relationship with said spiral coiled lap of said stationary scroll,

a rotary shaft which carries said swirling or rotating scroll and is securely joined to said shaft of said swirling or rotating scroll or said scroll type expander,

a self-rotation preventive means for preventing the self-rotation of said swirling or rotating scroll, and

a housing joined to said stationary scroll and to said housing of said scroll type expander;

an oil separator having a hermetically sealed space defined by said housings of said expander and said compressor;

a first heat exchanger which operates as a condenser in the case of the refrigeration cycle but as an evaporator in the case of the heating cycle;

a second heat exchanger which operates as an evaporator in the case of the refrigeration cycle but

as a condenser in the case of the heating cycle;

a refrigerant pump;

an expansion means;

an oil supply system consisting of an oil pump and

an oil line;

a generator for heating the refrigerant discharged from said refrigerant pump, thereby evaporating

the same; and

a seal means mounted on said rotary shafts between the housings of said expander and said compressor for gastightly isolating between said expander and said compressor.

4,326,392

MULTIPARTITE PROTECTIVE DEVICE FOR UNIVERSAL JOINT SHAFTS

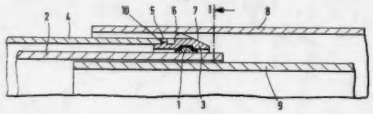
Hubert Geisthoff, and Clemens Nienhaus, both of Lohmar, Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Jun. 10, 1980, Ser. No. 158,254

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1979, 2925398

Int. Cl.³ F16C *1/06*

U.S. Cl. 64—3 **2 Claims**



1. A multipartite protective device particularly for universal joint shafts on agricultural machinery comprising inner and outer telescoping cylindrical protective tubes concentrically arranged with an outer surface of the inner tube located within and surrounded by the inner surface of the outer protective tube and means frictionally interposed between said tubes to prevent relative rotative motion therebetween, said frictionally interposed means comprising elastic braking tongues rotatably fixed relative to one of said tubes and extending into frictional engagement with the other of said tubes, said universal joint shafts including an outer section tube arranged within said inner protective tube, with support bearing means comprising an inner and an outer bearing member being arranged between said outer section tube and said inner protective tube, said outer bearing member being attached to the insertion end of said inner protective tube, with said elastic braking tongues being arranged at the periphery of said outer bearing member.

4,326,393

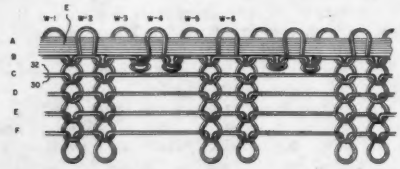
DECORATIVE FOOTLET-TYPE SOCK

Albert R. Dunlap, Mount Airy, N.C., assignor to Brown Wooten Mills, Inc., Burlington, N.C.

Filed Oct. 10, 1979, Ser. No. 83,255

Int. Cl.³ D04B *9/46*

U.S. Cl. 66—172 E **2 Claims**



1. A knit, low-cut, footlet-type sock adapted to be worn inside a low-cut shoe and substantially covered thereby with the exception of an exposed decorative welt, said welt comprising:

(a) a scalloped surface extending around at least a portion of said welt;

(b) said scalloped surface comprising:

(i) a plurality of courses formed of two yarns only, one being an elastic yarn and the other a body yarn, the two yarns being knit in plated relationship;

(ii) each of said courses including two knit stitches separated by a band of at least two adjacent float stitches;

(c) the combination of said elastic yarn and said knitting construction causing relatively wide bands or walewise ribs of raised fabric separated by a relatively narrow band of base fabric extending through the length of said welt;

(d) said scalloped surface being formed on the inside of said welt, and the welt being rolled over and tacked down to expose the scalloped surface on both the inside and outside of the exposed upper edge of the sock.

4,326,394

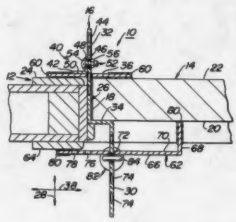
PORTABLE DOOR LOCK

Frederick Stein, Hollywood, Fla., assignor to Sandra Lichtman, Philadelphia, Pa.

Filed Aug. 22, 1980, Ser. No. 180,465

Int. Cl.³ E05B *73/00*

U.S. Cl. 70—14 **17 Claims**



1. A portable door lock releasably coupled to a door frame and a door member for positionally constraining said door member to said door frame, comprising:

(a) door engagement means insertable between said door member and said door frame at an interface thereof for matingly engaging said door member on a front and rear surface thereof and for contacting said door frame on a rear surface thereof;

(b) locking bar means displaceable on said door engagement means, said locking bar means extending across said interface of said door member and said door frame for contacting frontal surfaces of said door frame and said door member; and,

(c) a lock releasably securable to said door engagement means to prevent displacement of said locking bar means from said door engagement means.

4,326,395

ELECTRIC ENCLOSURE LOCKING ASSEMBLY

Pasquale A. DeRosa, 290 Winchester Ave., Staten Island, N.Y. 10312

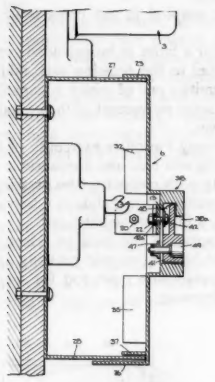
Filed Sep. 4, 1979, Ser. No. 72,220

Int. Cl.³ B65D *55/14;* **H02G** *13/14;* **H05K** *5/03, 5/04*

U.S. Cl. 70—168 **11 Claims**

1. In combination with a utility meter pan which comprises a back wall and outwardly projecting side wall means connected to the back wall to form a receptacle with an open side, a locking assembly for closing said receptacle open side, comprising bracket means extending across the interior of said meter pan, and attached to said side wall means at respective locations on opposite sides of said receptacle open side, a cover covering said receptacle open side and thereby preventing access to the interior of said receptacle, said cover having skirt portions which extend along and closely adjacent to the exterior of said side wall means and covering said locations of attachment of said bracket means, releasable retaining means extending through said cover and securing said cover to said bracket, a shield on said cover in a position covering said retaining means and thereby preventing access thereto, said cover having thereon projecting means defining a well therein,

said shield being received in said well of the cover with said projecting means being closely adjacent to the shield, lock receiving means on said shield and said cover, and removable



lock means engaging said lock receiving means on said shield and said cover for locking said shield on said cover in its said position covering said retaining means.

4,326,396

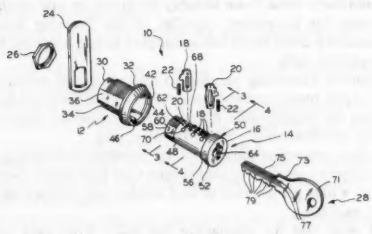
PLATE TUMBLER FOR A CYLINDER LOCK MECHANISM

Robert L. Steinbach, Glendale Heights, Ill., assignor to Chicago Lock Co., Chicago, Ill.

Filed Jan. 14, 1980, Ser. No. 111,536

Int. Cl.[3] E05B *15/14, 29/02*

U.S. Cl. 70—364 R **9 Claims**



1. An improved plate tumbler for a cylinder lock mechanism, said lock mechanism including: a tubular barrel provided with an internal longitudinal tumbler-receiving groove bounded by a tumbler-engaging longitudinal side wall, and a key plug assembly mounted in said barrel for rotation relative thereto from a locking position to an unlocking position, said plug assembly including a key plug, a plurality of plate tumblers disposed in said plug in a longitudinal series, and spring means resiliently mounting said tumblers in said plug, said plug being provided with a longitudinal keyway and with a plurality of transverse tumbler-receiving slots intersecting said keyway and arranged for registry with said groove in said locking position of the plug assembly, each of said slots being bounded by a pair of opposed tumbler-engaging transverse side walls, each of said tumblers being received in a tumbler-receiving slot substantially completely within said plug in a plug-release position of the tumbler and being reciprocally movable in the slot between such release position and a plug-locking position of the tumbler wherein a barrel-engaging end thereof projects from the plug for reception in said groove when in registry with the slot, said tumblers being biased by said spring means towards their locking positions, and said tumblers engaging a bitted key inserted in said keyway thereby to move the tumblers out of their locking positions and into their release positions and enable the plug assembly to be rotated to its unlocking position; said improved tumbler being receivable in a tumbler-receiving slot for movement between such release and locking positions while biased towards its locking position by said spring means, and for such engagement with a key, and comprising:

a plate-like body portion having a leading edge and a trailing edge on opposite sides of a longitudinal axis of the body portion, said body portion being received in one of said slots with said axis extending transversely of the plug and said edges disposed adjacent to respective ones of the transverse side walls bounding the slot for engagement therewith when the tumbler is disposed in the slot,

one end portion of said leading edge at a barrel-engaging end of the tumbler projecting from said plug into said groove in the barrel for engagement with said longitudinal side wall to prevent relative rotation of said plug assembly towards its unlocking position when the plug assembly is in its locking position with the tumbler disposed in its locking position in said one slot,

the opposite end portion of said leading edge at the opposite end of the tumbler extending obliquely inwardly in a direction towards said axis and towards said opposite end of the tumbler,

one end portion of said trailing edge at said barrel-engaging end of the tumbler projecting from said plug into said groove when the plug assembly is in its locking position with the tumbler disposed in its locking position in said one slot,

said one end portion of the trailing edge extending arcuately outwardly away from said axis and towards said barrel-engaging end of the tumbler,

and a portion of said trailing edge adjacent to said one end portion thereof extending from the latter portion obliquely outwardly in a direction away from said axis and towards said opposite end of the tumbler,

whereby, when the plug assembly is in its locking position with the tumbler in its locking position in said one slot, and torque is applied to the plug assembly tending to rotate it to its unlocking position while a force is applied to the tumbler tending to move the tumbler to its release position in a picking operation, said one end portion of the leading edge engages said longitudinal side wall, and said opposite end portion of the leading edge engages the adjacent transverse side wall, while said one end portion of the trailing edge projects laterally outwardly over the plug from the transverse side wall which is adjacent to such end portion, in engagement with the plug to prevent the tumbler from being moved into its release position, thereby to prevent rotation of the plug assembly to its unlocking position.

4,326,397

MULTIPLE MANDREL-RING ROLLING MACHINE

Alfred Strugala; Robert Schilling, both of Dortmund, and Dieter Adamaszek, Kamen, all of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Apr. 21, 1980, Ser. No. 141,767

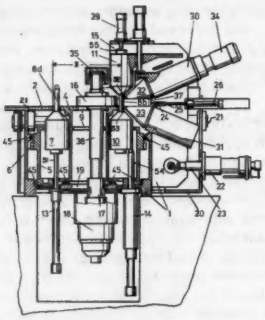
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917369

Int. Cl.[3] B21H *1/06*

U.S. Cl. 72—110 **13 Claims**

1. A multiple-mandrel ring rolling machine for producing a ring from a ring blank comprising a frame, a rolling platform, means for mounting said rolling platform to said frame for rotary movement relative thereto, a main roll movably mounted on said frame above said platform, a plurality of elongated mandrel rolls mounted below said rolling platform, each of said mandrel rolls including a longitudinal axle having oppositely disposed ends, each of said mandrel rolls being

mounted on said rolling platform for rotation about its own axle, and said mandrel rolls being axially displaceable relative



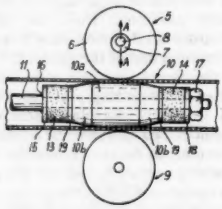
to said rolling platform between a first position above said rolling platform for rolling the ring blank and a second position below said rolling platform.

4,326,398

APPARATUS TO EQUALIZE IN HEIGHT, BY HAMMERING, THE LINE OF WELDING OF LONGITUDINALLY WELDED TUBES

Bernard Begue, Pavillon sous Bois, France, assignor to Vallourec, Paris, France

Filed Dec. 12, 1979, Ser. No. 102,758
Int. Cl.³ B21J *7/04*
U.S. Cl. 72—193 **7 Claims**



1. A device to equalize in height, by hammering, the bead of welding of tubes welded longitudinally having inside the tube an anvil mounted on the end of a rod passing through the tube, adjustable in longitudinal position, whose exterior surface comes in contact with the internal wall of the tube, an external hammering mass operated with a successive vertical movement, and a support member mounted opposite the hammering mass, the improvement comprising, means for moving the hammering mass at an impact frequency greater than 2,500 impacts/minute, an elastomer bushing axially at each end of and engaging said anvil, for restraining said anvil against axial movement in either direction, and means for preventing axial displacement of said bushings along the rod.

4,326,399

EXTRUSION PRESS OPERATING BY THE INDIRECT METHOD

Michel Doudet, Epone, France, assignor to SECIM, Courbevoie, France

Filed Mar. 14, 1978, Ser. No. 886,771
Int. Cl.³ B21C *33/00, 35/00, 35/04*
U.S. Cl. 72—263 **3 Claims**

1. A press for extruding tubes by the indirect method comprising:

a fixed tubular die casing having a die and defining a pressing axis,

a main cross beam supported for movement parallel to the pressing axis,

a main jack coupled to the cross beam for displacement thereof,

a container for a billet to be extruded supported for movement parallel to the pressing axis, said container having open extremities one of which is capable of fitting on the die casing upon movement of the container parallel to the pressing axis,

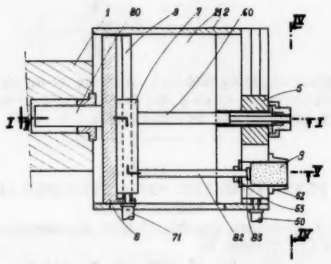
a base for closing the other extremity of the container,

a slide carrying said base and displaceable on the cross beam transversely with respect to the pressing axis,

a housing mounted on said slide in a laterally offset position for loading a billet to be extruded,

means for displacing the slide to selectively position said base or said housing on said pressing axis,

an axially displaceable push rod for displacing said billet from said housing,



an auxiliary jack mounted within the main jack and acting along the pressing axis,

an auxiliary cross beam slidably mounted on said main cross beam for movement parallel to the pressing axis; said auxiliary cross beam being coupled to and actuated by said auxiliary jack,

a support extending parallel to said slide and mounted for slidable transverse movement in said auxiliary cross beam,

means for controllably displacing said support transversely and simultaneously with the slide, and

a holder extending parallel to the pressing axis having a rear extremity secured to said support for movement therewith and a plunger secured to said holder and slidably mounted in said base,

said push rod for displacing the billet from said housing having a rear extremity also secured to said support for movement therewith and a front extremity slidably mounted on said slide axially within said housing.

4,326,400

NON-SLIP MULTI-PASS WIRE MILL

Vadim A. Davydov, ulitsa Mikhailova, 29, korpus 3, kv. 57; Vladimir I. Khromov, Leninsky prospekt, 26, kv. 34; Igor M. Makeev, Frunzenskaya naberezhnaya, 36, kv. 227; Aizik M. Kogos, ulitsa Fedora Poletaeva, 24, korpus 2, kv. 50, all of Moscow, and Leonid I. Rymarenko, prospekt Lenina, 10 "A", kv. 28, Balashikha Moshovskoi oblasti, all of U.S.S.R.

Filed Mar. 7, 1980, Ser. No. 127,946
Claims priority, application U.S.S.R., Mar. 7, 1979, 2734370
Int. Cl.³ B21C *1/10, 1/27*
U.S. Cl. 72—280 **3 Claims**

1. A nonslip multi-pass wire mill comprising:

a bed;

a coiler;

an uncoiler;

a bath mounted on said bed;

a plurality of dies for wire drawing;

die holders for said dies, arranged inside said bath in an order ensuring the manufacture of a wire of specified dimensions;

a plurality of blocks sequentially located relative to said dies to effect drawing;

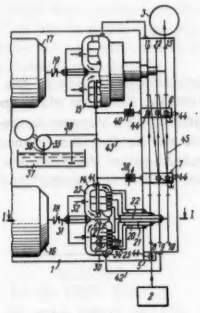
at least one adjustable torque converter actuated by an electric motor; said torque converter rotating at least one of said individual blocks; said torque converter comprising:

a housing having a working chamber containing a working fluid necessary for the operation of said torque converter;

a pump rotor mounted in said working chamber for producing during pumping a low-pressure zone and a high-pressure zone upstream and downstream, respectively, of said rotor;

turbines, the number of which corresponds to that of said blocks; said turbines being actuated by said torque converter, said turbines being mounted in said working chamber of said housing of said torque converter and cooperating with the pump rotor; said mill further including:

a system for supplying a coolant-lubricant serving also as said working fluid of said torque converters comprising:



a coolant-lubricant tank;

a pumping station communicating with said tank and having a pressure line;

adjustable throttles, the number of which corresponds to that of said die holders;

said pressure line connected through said adjustable throttles to said die holders for supplying thereto said coolant-lubricant during the drawing of wire;

ducts in said housing of each said torque converter connecting said pressure line with said low-pressure zone of each said torque converter;

pipes connecting said high-pressure zone of each said torque converter and said bath;

a draining pipe connecting said bath in a lower level thereof to said tank;

the connection between said ducts, said pipes and said working chambers of each said torque converter providing communication between said pressure line and said bath causing circulation of said coolant-lubricant through said torque converter thereby conditioning said coolant-lubricant for drawing wire by said torque converter.

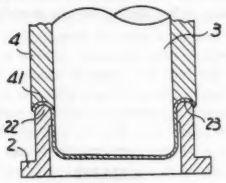
4,326,401

APPARATUS FOR REVERSE REDRAWING

Kenichi Inoue, Ibaragi, Japan, assignor to Daiwa Can Company, Ltd., Japan

Filed Mar. 28, 1980, Ser. No. 134,972
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—350 **1 Claim**

1. In apparatus for reverse redrawing of a cup having a bottom wall and a body portion, said apparatus including a die ring of hollow cylindrical body portion on which the cup can be crowned, and a punch for pushing the bottom wall of the cup into the die ring thereby effecting drawing while reversing the face side and the back side of the cup, the improvement of a fixed annular ring provided encirclingly around the upper



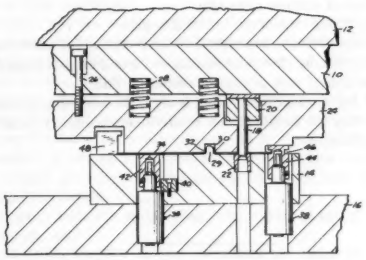
end portion of the body portion of the die ring at the outside of the die ring and concentrically with the die ring, there being a clearance provided between the inside surface of the fixed annular ring and the outside surface of the die ring, said clearance being only slightly larger than the thickness of the cup body portion.

4,326,402

STOCK LIFTER FOR PROGRESSIVE DIES

Bernard J. Wallis, 25200 Trowbridge Ave., Dearborn, Mich. 48124

Filed Apr. 18, 1980, Ser. No. 141,686
Int. Cl.³ B21J *13/08*
U.S. Cl. 72—420 **13 Claims**



1. A stack lifter for a progressive die having upper and lower die members for forming workpieces therebetween, said stock lifter comprising a vertically disposed fluid cylinder fixedly mounted on the lower die member, a piston slideably arranged within said cylinder and having a piston rod extending upwardly through the upper end of the cylinder in sealed relation therewith, means sealing the lower end of the cylinder from the surrounding atmosphere, said piston rod having a smaller outer diameter than said piston so that the bottom face of the piston has a larger area than the top face thereof, said piston

rod having an axial passageway extending downwardly from the upper end thereof and communicating freely with the portions of the cylinder above and below the piston, means adjacent the upper end of the piston rod communicating with said passageway for charging the cylinder to a selected predetermined gas pressure so that the piston is biased upwardly in the cylinder with a predetermined desired force and means at the upper end of the piston rod for engaging strip stock disposed between the die members and adapted to lift it from the lower die member when the upper die member is raised.

4,326,403

Patent Not Issued For This Number

4,326,404

RESPIRATORY MONITOR

Jasu G. Mehta, 15 Stonewall La., Mamaroneck, N.Y. 10543

Filed Mar. 3, 1980, Ser. No. 126,667

Int. Cl.³ A61B *5/08*

U.S. Cl. 73—29 **11 Claims**

1. Apparatus for detecting the quantity of moisture in a gas in a given region comprising:

a crystal of sodium chloride;

a support for said crystal in said region;

means operatively connected to said crystal for detecting a change in the electrical resistance of said crystal caused by exposure of said crystal to moisture; and

means for intermittently supplying a flow of dry gas over said crystal sufficient to remove accumulated moisture therefrom.

4,326,405

APPARATUS FOR DETECTING BONDING DEFECTS IN LAMINATES

Harold R. Ingle, Jr., 2665 Jamerson Rd., NE., Marietta, Ga. 30066

Filed Aug. 11, 1980, Ser. No. 176,935

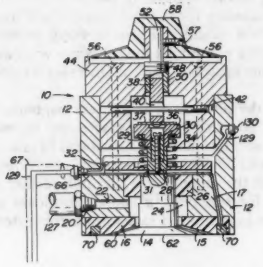
Int. Cl.³ G01N *29/00*

U.S. Cl. 73—37 **17 Claims**

1. Apparatus for testing bonded laminates which include a substrate and a face sheet bonded thereto, comprising:

(a) means for producing an air cushion between an examining surface of the apparatus and the face sheet of the laminate by applying high velocity air flow from at least one air nozzle in the examining surface;

(b) the examining surface including a detection plate having



means for detecting deflection of the face sheet of the laminate toward the detection plate; and

(c) means for producing a vacuum in the area between the detection plate and the face sheet, whereby the face sheet will be deflected toward the detection plate in any area where the face sheet is not bonded to the substrate.

4,326,406

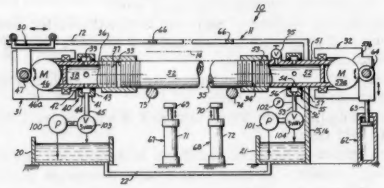
PRESSURE TESTER FOR PIPES

Eugene D. Smith, 3100 Hollins, Bakersfield, Calif. 93305

Filed Mar. 21, 1980, Ser. No. 131,943

Int. Cl.³ G01M *3/28*

U.S. Cl. 73—49.1 **18 Claims**



1. Apparatus for testing the ability of a length of pipe to withstand internal pressure, said pipe having a pipe axis, a first end, a second end, a thread at each end, and a pipe passage extending from end to end, said apparatus comprising:

a frame having a longitudinal frame axis, and including a rail member extending axially along at least a portion of the axial length of the frame;

a carriage axially slidable on said rail member;

first pipe engagement means mounted to said carriage, said first pipe engagement means comprising a first threaded plug having a plug axis and threadable to said first end of said pipe, first bearing means supporting said plug for threading and unthreading rotations around its said plug axis, means for rotating said first plug bi-directionally,

trunnion means mounting said first bearing means to said carriage for rotation in a vertical plane, whereby said first plug is axially movable along said frame axis, and rotatable in said vertical plane, and rotatable around its own axis, said first plug having a first plug passage which communicates with said pipe passage when they are threaded together;

first liquid supply means connected to said first plug passage for supplying liquid thereto;

a tilt elevator mounted to said frame and having an elevator portion movable up and down in a vertical plane;

second pipe engagement means mounted to said elevator portion, said second pipe engagement means comprising a second threaded plug having a plug axis and threadable to said first end of said pipe, second bearing means supporting said plug for threading and unthreading rotation around its said plug axis, means for rotating said second plug bi-directionally, trunnion means mounting said second bearing means to said elevator portion for rotation in said vertical plane, whereby said second plug is movable up and down and rotatable in said vertical plane, and rotatable around its own axis, said second plug having a second plug passage which communicates with said pipe passage when they are threaded together;

second liquid supply means connected to said second plug passage for supplying liquid thereto;

an on-off vent valve communicating with said passage in said second plug;

gauge means communicating with one of said passages to measure the pressure therein; and

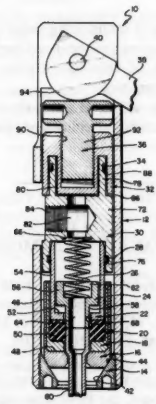
control means for controlling operation of said first and second liquid supply means.

4,326,407

LEAK TEST TOOLS

Homer Van Meter, deceased, late of Sun City Center, Fla., and by Geraldine S. Van Meter, executrix, 1628 Vincennes Dr., Sun City Center, Fla. 33570

Filed Aug. 29, 1980, Ser. No. 182,434
Int. Cl.³ G01M *3/08*; F16L *37/18*
U.S. Cl. 73—49.1 **8 Claims**



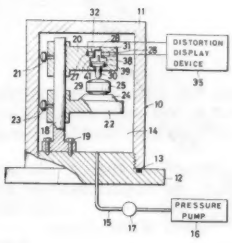
1. A fitting for mounting to the ends of smooth wall tubes for leak testing expanded end tubes, beaded end tubes and barbed end tubes, said fitting comprising a generally cylindrical-shaped hollow body having retained therein a split collet having a bottom wall and a cam surface on the outer peripheral edge of said bottom wall, a retainer having a bottom wall disposed within said split collet, an adapter having a bottom wall disposed within said retainer, a seal disposed between the bottom walls of said retainer and said adapter, said seal and the bottom walls of said split collet, said retainer and said adapter each having therein an aperture for receiving therethrough the end of a tube to be tested, a tube stop disposed within said adapter engageable by the terminal end of the tube to be tested, a piston assembly engageable with said adapter to longitudinally reciprocate said adapter to compress said seal in sealing engagement with a tube to be tested and to operate said split collet to grip the outside diameter of said tube, and a head threadedly retained in a tube receiving end of said hollow body having a cam surface thereon complimentary with and engageable with said cam surface of said split collet to operate said split collet; and a handle at the other end of said hollow body having a cam surface thereon operable to longitudinally reciprocate said piston assembly when said handle is operated.

4,326,408

AIRTIGHTNESS TESTING APPARATUS FOR WATCHES

Chiyuki Kanoh, 7-8-2-1006, Funabashi, Setagaya-ku, Tokyo, Japan

Filed Feb. 7, 1980, Ser. No. 119,373
Claims priority, application Japan, Feb. 9, 1979, 54-15765[U]
Int. Cl.³ G01M *3/36*
U.S. Cl. 73—49.3 **11 Claims**



1. An airtightness testing apparatus for watches, comprising:

an airtight container;

pressure control means capable of being so operated as to pressurize or decompress the interior of said container;

a testing stand having a seat to carry a watch to be examined inside said airtight container;

adjusting means to move said testing stand in the vertical direction for the adjustment of the position of said stand;

means for detecting a distortion of the to-be-examined watch which is caused by a change of the pressure inside said airtight container due to the operation of said pressure control means;

a support assembly supporting at least part of said detecting means; and

a distortion display device providing an operator with a change of distortion detected by said detecting means, characterized in that said detecting means includes;

a light emitting element supported by said support assembly and emitting light as a luminous flux of a regular size,

a light receiving element supported by said support assembly so as to face said light emitting element with a fixed gap inbetween and supplying a first signal corresponding to the size of the luminous flux produced from said light emitting element, and

a movable member composed of a contact portion touching said watch and capable of vertical movement in accordance with the change of distortion of said watch and a screening plate portion accompanying said contact member to move vertically in said gap and restricting the

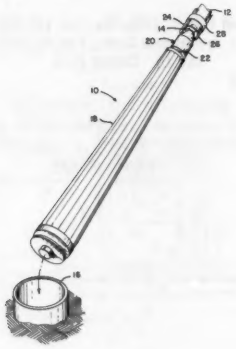
luminous flux from said light emitting element to said light receiving element, thereby changing the size of the luminous flux received by said light receiving element, and that said distortion display device includes;

a display circuit to indicate the change of said first signal.

4,326,409
SITU BORE HOLE TEST PROBE

John M. O. Hughes, 533 East 5th, North Vancouver, British Columbia, Canada

Filed May 19, 1980, Ser. No. 151,139
Int. Cl.³ G01N *3/00*
U.S. Cl. 73—84 **11 Claims**



1. A bore hole test probe, comprising:

a cylindrical body having a hollow core and end portions tapering inwardly to form respective reduced diameter sleeves;

a resilient, cylindrical expansion membrane having opposite ends extending along the tapered portions of said body, said body having a fluid passage extending between said core and said expansion membrane such that pressure applied to said core outwardly expands said expansion membrane;

respective annular clamping members surrounding said sleeves and having inner surfaces tapered to match the taper of said cylindrical body, said clamping members being forced toward each other to compress the ends of said expansion membrane between said clamp members and the tapered portions of said body;

a plurality of axially spaced, circumferential grooves surrounding the tapered portions of said body to maximize the bond between said expansion membrane and said body;

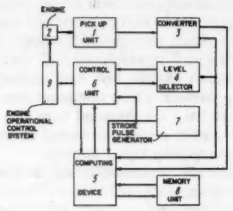
feeler means resiliently biased against the inside surface of said expansion membrane for providing an indication of expansion thereof; and

a plurality of circumferentially spaced reinforcing fingers extending longitudinally along the outer surface of said expansion membrane at the junctions between said expansion member and said body to reinforce said expansion membrane against relatively strong shear stresses produced near said junction.

4,326,410
ENGINE TEST METHOD

Ivan D. Bukhtiyarov, Novosibirsky raion, rabochy poselok Krasnoobsk, 3, kv. 137; Viktor B. An, Novosibirsky raion, rabochy poselok Krasnoobsk, 3, kv. 5, both of Novosibirskaya oblast; Marat N. Farshatov, ulitsa S. Razina, 46, kv. 20, Kuibyshevskaya oblast, Tolyatti; Fedor F. Sapozhnikov, ulitsa Sverdlova, 187, kv. 211, Kuibyshevskaya oblast, Tolyatti; Anatoly G. Sidorov, ulitsa Revoljutsionnaya, 125, kv. 16, Kuibyshevskaya oblast, Tolyatti; Natalya A. Proskurina, bulvar Kulibina, 9, kv. 12, Kuibyshevskaya oblast, Tolyatti, and Vladimir I. Marakin, Novosibirsky raion, rabochy poselok Krasnoobsk, 7, kv. 165, Novosibirskaya oblast, all of U.S.S.R.

Filed Jun. 3, 1980, Ser. No. 156,203
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—117.3 **5 Claims**



1. A method for testing an engine comprising the steps of:

starting said engine;

controlling a fuel feed of said engine to obtain steady running at a first speed;

performing a first runup-rundown cycle consisting of accelerating said engine from said first speed to a second speed, and permitting said engine to decelerate to a third speed;

monitoring at least one parameter of said engine during said first runup-rundown cycle;

selecting parameters for a second runup-rundown cycle based on the monitored parameter during said first runup-rundown cycle;

performing said second runup-rundown cycle consisting of accelerating said engine from said third speed to a fourth speed and permitting said engine to decelerate to a fifth speed;

continuing the steps of monitoring, selecting and performing to produce subsequent runup-rundown cycles;

comparing a result of said monitoring with at least one standard parameter; and

ending said testing when the result of said monitoring reaches a predetermined relationship with said standard parameter.

4,326,411
METHOD AND APPARATUS FOR MONITORING FLUID FLOW

Robert C. Gant, and John E. Reeves, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

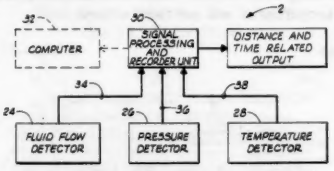
Filed Jul. 14, 1980, Ser. No. 167,920
Int. Cl.³ E21B *47/06*
U.S. Cl. 73—155 **41 Claims**

1. A system for monitoring conditions in a fluid flow path along which a fluid flows, the fluid flow path being defined by a conduit having a plurality of identifiable structural elements, said system comprising:

velocity detecting means for detecting the velocity of the fluid at a plurality of positions along the fluid flow path as the fluid flows therealong; and

recording means for recording the velocity detected at each

of said plurality of positions so that substantial variations in the recorded velocities are perceivable for correlation



to the identifiable structural elements of the conduit defining the fluid flow path.

4,326,412

FLOWMETER OF HOT WIRE TYPE

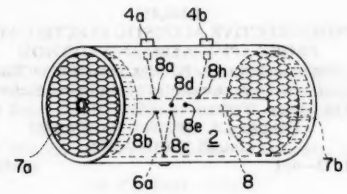
Hiroshi Kobayashi, Yokosuka; Toru Kita, Yokohama, and Takeshi Fujishiro, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 31, 1979, Ser. No. 62,528

Claims priority, application Japan, Aug. 5, 1978, 53-95020; Nov. 14, 1978, 53-155741[U]

Int. Cl.³ G01F *1/68*

U.S. Cl. 73—204 **9 Claims**



1. A flowmeter of a hot wire type for a measurement of flow rate of fluid flowing through a fluid passage, the flowmeter comprising:

an electrically heatable wire stretched within a section of the fluid passage bounded by two spaced planes normal to the direction of the fluid flow;

means for electrically measuring the temperature drop of the wire caused by the fluid flow in the fluid passage;

said wire being wound around the central axis of said fluid passage like a helix traced on a side surface of a barrel shape in such a manner that the heat release from said wire in its entirety approximates the mean fluid velocity averaged within said section of said fluid passage.

4,326,413

LIQUID-LEVEL GAUGE FOR VEHICLES

Mikio Takeshita, Toyota, and Hiroyuki Tashiro, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 28, 1980, Ser. No. 115,665

Claims priority, application Japan, Mar. 13, 1979, 54/31848[U]

Int. Cl.³ G01F *23/10*

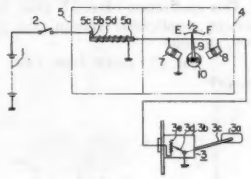
U.S. Cl. 73—313 **4 Claims**

1. A liquid-level gauge for vehicles comprising:

a container for containing liquid provided within a vehicle;

a detector mounted to said container for producing a detected signal corresponding to a liquid level of the liquid;

an indicator connected to said detector for indicating a liquid level value by a pointer in response to the detected signal derived from said detector, said indicator including a reference magnetic field generating coil, a variable magnetic field generating coil and a moving magnet, and said indicator being of leaving pointer type in which, when said coils are deenergized, an indication of said pointer rotated by said moving magnet is held at a value just before the deenergization; and



a timer circuit connected to said indicator and a power source through a power source switch, which permits electric power to intermittently pass through said switch to said coils of said liquid level indicator with given intervals, after the power source switch is turned on.

4,326,414

HUMIDITY DETECTING APPARATUS

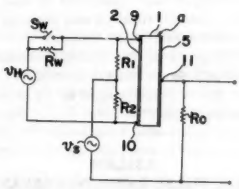
Jiro Terada, and Tsuneharu Nitta, both of Katana, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 26, 1979, Ser. No. 107,182

Claims priority, application Japan, Dec. 26, 1978, 53/165743; Jul. 31, 1979, 54/99177

Int. Cl.³ G01W *1/00*

U.S. Cl. 73—336.5 **12 Claims**



1. A humidity detecting apparatus for measuring ambient humidity and having a humidity detecting resistor element comprising:

a humidity detecting portion of a metallic oxide material whose resistance is related to said ambient humidity and having first and second electrodes on opposite sides thereof;

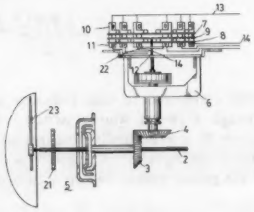
said first electrode having first and second terminals and of a resistive material, wherein when an electrical current is passed between said first and second terminals, said first electrode operates as a resistance heating unit to thereby heat said humidity detecting resistor element; and

said second electrode having a third terminal arranged such that said resistance of said humidity detecting portion is measured between said first and third terminals to thereby determine said ambient humidity.

4,326,415
SPEED INDICATING APPARATUS FOR VEHICLES

Jiunn-Feng Lee, 4th Fl., 103, Sec. 2, Wu-Chang St., Taipei, Taiwan

Continuation-in-part of Ser. No. 42,120, May 24, 1979, Pat. No. 4,227,416. This application Mar. 27, 1980, Ser. No. 134,662
Claims priority, application Taiwan, Jan. 5, 1978, 6720026; Aug. 20, 1979, 6823004
Int. Cl.³ G01P *3/36, 3/50*
U.S. Cl. 73—499 **4 Claims**



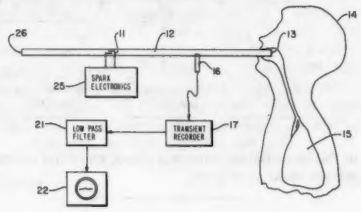
1. A speed indicating apparatus for a vehicle, comprising:
a speed counter coupled to the speedometer cable of the vehicle; and
a plurality of indicator lights mounted externally on the rear frame of the vehicle and controlled by said speed counter, said speed counter including;
a frame including two spaced discs, one of said discs having a plurality of holes therethrough spaced along one-half of the periphery thereof;
a corresponding plurality of light sources arranged to project light through respective ones of said holes;
a corresponding plurality of photoelectric sensors on the opposite side of said one disc from said light sources and arranged to receive light from respective ones of said light sources through said holes;
a semicircular plate of equal size to said discs, said plate being concentrically rotatably mounted between said discs such that said plate selectively blocks the paths of light between respective ones of said light sources and said photoelectric sensors as said plate is rotated with respect to said discs; and
magnetic coupling means connected to said plate and the speedometer cable for rotating said plate an amount corresponding to the speed of the vehicle.
whereby, as the speed of the vehicle increases, said plate is rotated to block an increasing number of light paths to said sensors and to thereby light up an increasing number of said indicator lights.

4,326,416
ACOUSTIC PULSE RESPONSE MEASURING

Jeffrey J. Fredberg, Sharon, Mass., assignor to Cambridge Collaborative, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 932,033, Aug. 8, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 120,618
Int. Cl.³ G01N *24/00*
U.S. Cl. 73—597 **14 Claims**

1. Apparatus for measuring physical properties of a confined volume comprising,
conduit means for exchanging acoustical energy with said confined volume,
means for propagating a pressure pulse within said conduit through an opening thereof for entry into the confined volume,
electroacoustical transducing means in said conduit responsive to acoustical energy therein for providing an electrical signal representative of wave energy having spectral components in a substantial portion of the audio frequency range above 100 Hz reflected through said opening in response to said pressure pulse propagated through said opening provided by said means for propagating,
and utilization means responsive to said detected signal for providing a representation thereof characteristic of physical properties of said confined volume,

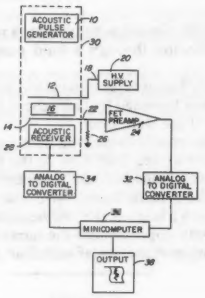


said physical properties including the cross sectional area of said confined volume as a function of its distance from said opening.

4,326,417
NONDESTRUCTIVE ACOUSTIC ELECTRIC FIELD PROBE APPARATUS AND METHOD

Albert Migliori, Santa Fe, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 8, 1980, Ser. No. 176,441
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—601 **10 Claims**

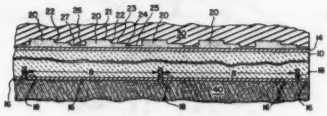


1. A nondestructive acoustic electric field probe comprising:
means for producing an electric field having a direction across material to be tested;
means for generating an acoustic pulse having a known shape and amplitude and for directing it through said material substantially in accordance with the direction of the electric field;
means for receiving said pulse after it has passed through and been modulated by said material;
means for determining the voltage across the material while the acoustic pulse passes through it; and
means for analyzing said acoustic pulse after it has passed through and been modulated by said material and the voltage change on the material during the passage of said acoustic pulse to determine preselected characteristics of said material.

4,326,418
ACOUSTIC IMPEDANCE MATCHING DEVICE

James W. Pell, Jr., El Toro, Calif., assignor to North American Philips Corporation, New York, N.Y.

Filed Apr. 7, 1980, Ser. No. 137,675
Int. Cl.[3] G01N *29/00*
U.S. Cl. 73—644 44 Claims



1. An impedance matching device for coupling wideband sonic energy between one or more acoustic transducers and an object, comprising:

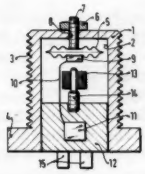
a periodic array of stepped matching structures disposed side-by-side over an active surface of the transducers,

each of the matching structures comprising two or more flat parallel strips of sound-conductive material which are disposed, side-by-side, over the active surface in a stepped configuration wherein the thickness of successive strips increases monotonically across the structure.

4,326,419
ELECTROMECHANICAL PRESSURE TRANSDUCER

Werner Herden, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 19, 1980, Ser. No. 122,042
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1979, 2913935
Int. Cl.[3] G01L *19/04*
U.S. Cl. 73—708 10 Claims



10. System according to claim 1, wherein said energization means (60) provides unidirectional sequential pulses to the at least one electromagnet.

4,326,420
KERF PRESSURE PLATE MATERIAL TESTER

Roscoe E. Perham, Ledge La., Lebanon, N.H. 03766

Filed Oct. 10, 1980, Ser. No. 195,821
Int. Cl.[3] G01L *1/02*
U.S. Cl. 73—768 11 Claims

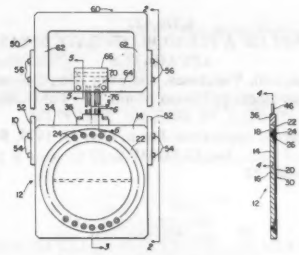
1. A kerf pressure plate materials tester comprising:

a generally planar, thin metal plate,

an annular groove in one face of said plate spaced inwardly from the edge of said plate,

a deformable diaphragm extending over the central portion of said one face and defining a chamber therebetween and extending at least partially over said annular groove,

means overlying said groove for clamping the peripheral portion of said diaphragm to said plate, said clamping



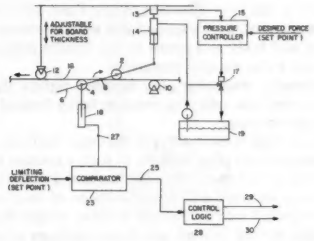
means lying substantially within the plane defining the said one face, and

passage means extending through said plate to said chamber.

4,326,421
CONTINUOUS PROOFLOADER

William D. Pilesi, Monroeville, and Harry J. Trautmann, Pittsburgh, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 24, 1980, Ser. No. 115,094
Int. Cl.[3] G01N *3/20*
U.S. Cl. 73—852 7 Claims



1. A proofloader for continuously determining the presence or absence of a predetermined minimum flexural strength and stiffness in a relatively rigid material such as wood along its path of travel through the loader comprising

a frame through which said material travels;

fulcrum means affixed to said frame and having a pivot point at the mid-point of the thickness of the material in its path of travel;

support means rotatable about said pivot point as a fulcrum for said support;

a pair of flexure means, each flexure means being affixed to opposite ends and on opposite sides of said support for applying a flexure force on opposite faces of said material as the material travels between the flexure means;

a pair of guide means, each guide means being affixed to said frame equidistant from said fulcrum means and positioned apart from said flexure means and on opposite sides of the path of the material whereby the guide means restrains the material to travel between the flexure means and guide means in a substantially horizontal path and to resist the force applied to the material by the adjacent flexure means;

load means affixed to said frame for applying a predetermined force to said support means whereby each flexure means deflects the material in an equal but different vertical direction from the horizontal path and the force is opposed by a respective guide means; and

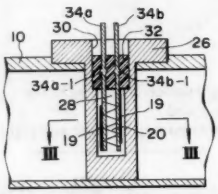
sensor means affixed to said frame for detecting the amount of deflection of said material as the material travels from one guide means to the other.

4,326,422

PROBE UNIT OF A FLUID FLOW RATE MEASURING APPARATUS

Hiroshi Kobayashi, Yokohama, and Toru Kita, Yokosuka, both of Japan, assignors to Nissan Motor Co., Yokohama, Japan

Filed Oct. 16, 1980, Ser. No. 197,699
Claims priority, application Japan, Oct. 17, 1979, 54-132909
Int. Cl.³ G01F *1/32*
U.S. Cl. 73—861.22 **5 Claims**



1. A probe unit of a fluid flow rate measuring apparatus, comprising:

a vortex generating body arranged to lie across the fluid stream substantially at right angles to the flow direction of said fluid, said body being formed with a first slot which extends therethrough substantially perpendicular with respect to the flow direction of said fluid, said body being further formed with a second slot which extends from the top of said body and opens to the middle portion of said first slot to be merged therewith;

an electrically insulating plug member tightly disposed in said second slot, said plug member being formed with two through openings;

two metal rods which are put through said two through openings of said plug member in such a manner that upper portions of said metal rods are projected sufficiently from said plug member and lower sections of said metal rods are projected into the middle portion of said first slot;

a hot wire wound around said lower sections of said metal rods, one end of said hot wire being connected to one of said metal rods and the other end of same being connected to the other of said metal rods; and

means for electrically insulating said hot wire from said metal rods except the portions of said metal rods to which the ends of said hot wire are connected.

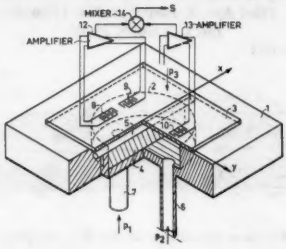
4,326,423

PRESSURE TRANSDUCER WITH ELASTIC SURFACE WAVES AND IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE UTILIZING THIS TRANSDUCER

Pierre Hartemann, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 14, 1980, Ser. No. 139,661
Claims priority, application France, Apr. 18, 1979, 79 09726
Int. Cl.³ G01L *9/06*
U.S. Cl. 73—861.63 **14 Claims**

1. A pressure transducer with elastic surface waves incorporating a deformable plate (3) resting by its periphery on a support (1), first and second oscillator means (12, 13), whose oscillation frequencies are determined by the first and second elastic surface wave exchange means located on one of the faces of said plate and mixer means (14) supplying a signal, whose frequency is equal to the difference of the oscillation frequencies of the first and second oscillator means, wherein the deformable plate rests on at least one intermediate support (5) permitting its pivoting, said support being fixed to the plate support, while the first and second exchange means are arranged in such a way that there are frequency shifts which are



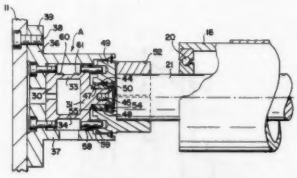
equal and of the same sign in the presence of a uniform mechanical stressing of the plate.

4,326,424

WEB TENSION TRANSDUCER ARRANGEMENT

Robert G. Koenig, Hudson, Ohio, assignor to Cleveland Machine Controls, Inc., Cleveland, Ohio

Filed Feb. 25, 1980, Ser. No. 118,807
Int. Cl.³ G01L *5/10*
U.S. Cl. 73—862.48 **14 Claims**

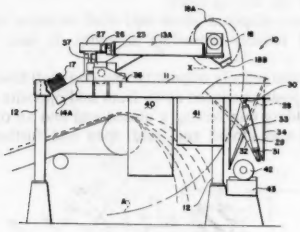


1. In a web tension measuring device for apparatus having a frame and adapted to handle a continuously moving web which passes partly around a transversely extending roller supported at least on one of its ends by said device, said device including a pair of spaced plates, one being fixed and adapted to be supported by the frame of said apparatus, and the other being movable and having roller support means adapted to support an end of said roller, a pair of spaced arms rigidly fastened at their ends to said plates with the plane defined by said arms being generally parallel to the plane of the transverse web forces on said roller, the improvement which comprises a pair of strain gages mounted on said arms in positions where one will be compressed and the other tensioned by forces parallel to said plane, said roller support means including a self-aligning spherical bearing and said strain gages being so electrically connected that resistance changes therein caused by longitudinal tension (or compression) forces in said arms caused by friction in said bearing cancel each other out, said roller support means comprising a boss on said movable plate and said self-aligning bearing including a member mounted on said boss and a second member operatively associated with the end of said roller.

4,326,425
DRIVE CONTROL ARRANGEMENT FOR SWING ARM MATERIAL SAMPLER

Ray S. Gundersen, Salt Lake County; Ronald J. Colledge; Roy H. Jenkins, both of Davis County, and Michael Crook, Salt Lake County, all of Utah, assignors to Sverdrup & Parcel and Associates, Inc., St. Louis, Mo.

Filed Oct. 8, 1980, Ser. No. 195,140
Int. Cl.³ G01N *1/20*
U.S. Cl. 73—863.53 **8 Claims**



1. A drive control arrangement for swing arm sampling apparatus having a pivotal sampling bucket moved by the swing arm in opposite directions through a free falling stream of material to be sampled from a home position at one side of the falling stream, said drive control arrangement comprising:

electrical motor driven hydraulic fluid pump means;

first reversible hydraulic fluid motor means connected to said swing arm;

second reversible hydraulic fluid motor means connected to said sampling bucket;

hydraulic fluid circuit means containing said hydraulic fluid pump and said first and second reversible hydraulic fluid motor means, including electrically controlled hydraulic fluid flow reversing valve means in said fluid circuit means for said first and second hydraulic fluid motor means;

first electrical switch means connected to said swing arm for actuation by said swing arm in predetermined positions of movement thereof;

second electrical switch means connected to said pivotal sampling bucket for actuation by said bucket in predetermined positions of pivotal movement thereof;

and electrical control circuit means containing said first and second electrical switch means, said electrically controlled fluid flow reversing valve means, and said electrical motor drive;

said electrical control circuit means including a controller for initiating operation of said hydraulic fluid pump means and for responding to first and second electrical switch means;

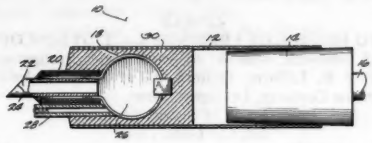
said controller being programmed for effecting the movement of said swing arm and the pivoting of said sampling bucket relative to said swing arm in obtaining a sample from the free falling stream.

4,326,426
MOLDED SAND INSULATED SAMPLER

Richard A. Falk, 519 Westminster Dr., Waukesha, Wis. 53186

Filed May 13, 1980, Ser. No. 149,378
Int. Cl.³ G01N *1/12*
U.S. Cl. 73—864.59 **2 Claims**

1. A molten metal sampler comprising a mold body defining a sample cavity, a sleeve around said sample cavity, including loose sand fill within said sleeve and surrounding said mold

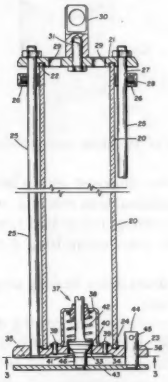


body, and a zone of sand-cement sealing said loose sand in place.

4,326,427
LIQUID SAMPLING GAUGE APPARATUS

Hubert J. Ueberschaer, Hartsdale, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 124,015, Feb. 25, 1980, abandoned. This application Dec. 30, 1980, Ser. No. 221,239
Int. Cl.³ G01N *1/12*
U.S. Cl. 73—864.65 **10 Claims**



1. A liquid sampling apparatus for obtaining a liquid sample from near the bottom of a liquid-filled container comprising:

a sample chamber normally open at its upper end;

means for raising and lowering said sample chamber into and out of said liquid-filled container;

a bottom closure member affixed to the lower end of said sample chamber to prevent liquid flow into said sample chamber; said bottom member having an inlet opening therethrough;

valve support means mounted on said bottom closure member;

a valve slidably mounted in said valve support means and positioned to engage said inlet opening in said bottom closure member when said valve is in a closed position;

spring means for normally biasing said valve to said closed position;

actuating means for opening said valve means to permit liquid flow through said inlet opening into said sample chamber when said liquid sampling apparatus engages the bottom of said liquid-filled container and to close said valve means when said liquid sampling apparatus is lifted from engagement with said bottom of said liquid container; and

said actuating means comprising an actuator plate, means for slidably mounting said actuator plate on said bottom closure member, and a valve lifter mounted on the upper surface of said actuator plate and adapted to engage and

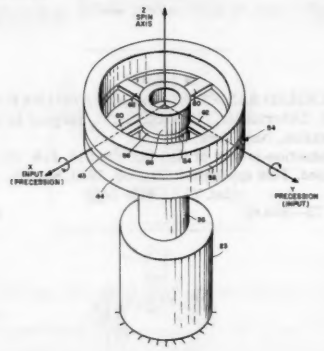
lift said valve to an open position when said actuator plate is moved upward relative to said bottom closure member.

4,326,428

TWO DEGREE OF FREEDOM RATE GYROSCOPE

Lewis S. Bostwick, Andover; Albert V. Filosa, Burlington, and Richard R. LaTorre, Bedford, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 3, 1979, Ser. No. 81,504
Int. Cl.[3] G01C *19/22*
U.S. Cl. 74—5 F 4 Claims



1. A two degree of freedom rate gyroscope comprising:

(a) a housing;

(b) a rotatable mass disposed within said housing; said mass having a longitudinal spin axis and two input angular rate axes mutually orthogonal to said spin axis;

(c) said rotatable mass comprising a rotor and a rotating drum;

(d) said rotating drum being flexibly coupled to said rotor by suspension means;

(e) said suspension means comprising diametrically extending sets of elastic arms; one set of said arms being disposed orthogonally to a second set of such arms; said elastic arms having a predetermined elasticity sufficient to restrain the precession of the mass in response to angular rates about the two input angular rate axes such that the mass achieves an angular orientation about a pair of output axes proportional to the magnitude of such angular rates.

4,326,429

ENGINE STARTER DRIVE ASSEMBLY WITH SHIELDING MEANS

Harold R. Mortensen, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Division of Ser. No. 932,965, Aug. 11, 1978, Pat. No. 4,208,922, which is a continuation of Ser. No. 741,812, Nov. 15, 1976, abandoned. This application Jan. 22, 1980, Ser. No. 114,185
Int. Cl.[3] F02N *15/06*
U.S. Cl. 74—7 R 6 Claims

1. An improved engine starter assembly for engaging an engine flywheel comprising:

a driving shaft having an end and an opposite section disposed away from said end;

a pinion gear mounted on said opposite section for relative axial and rotatable movement with respect thereto, said pinion gear having a flange disposed radially from said shaft and extending along said opposite section of said shaft toward said end;

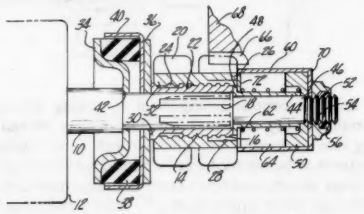
means for moving said pinion gear to and from a retracted position opposite said end and for moving said pinion gear into and out of driving engagement with an engine flywheel;

a stop axially fixed on said shaft toward said end in a position spaced away from said opposite section and said pinion gear when said pinion gear is in the retracted position, said stop locating said pinion gear when said pinion gear is in engagement with said engine flywheel to start the engine;

a bearing sleeve mounted about said shaft between said stop and said opposite section, said bearing sleeve having a radially extending shoulder opposite said axial stop, adjacent said opposite section, and touching said end of the driving shaft;

biasing means disposed about said shaft between said stop and said radially extending shoulder on said bearing sleeve;

a shielding cup radially disposed about said shaft toward said end in a position spaced away from said opposite section, said shielding cup having a closed end and an open end opposite said closed end, said open end further being



located adjacent said flange of said pinion gear, said closed end being axially fixed to said shaft adjacent to said stop, said shielding cup further being dependently mounted on said axial stop;

movable means interposed between said bearing sleeve shoulder and said biasing means for radially supporting said open end of said shielding cup independently of said pinion gear said movable means being entirely within said shielding cup, and said flange of said pinion gear being in continuous abutting engagement with said movable means;

whereby said flange of said pinion gear and said shielding cup cooperate to prevent foreign matter from entering between said flange of said pinion gear and said driving shaft when said pinion gear is moved out of engagement with said engine flywheel and to prevent foreign matter from entering between said shielding cup and said driving shaft when said pinion gear is moved into and out of driving engagement with said engine flywheel.

4,326,430

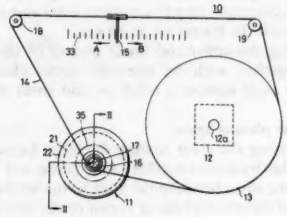
INDICATION ELEMENT DRIVING DEVICE

Morio Hamada, Hino, Japan, assignor to Shinwa Audio Company, Ltd., Tokyo, Japan

Division of Ser. No. 913,609, Jun. 7, 1978, abandoned. This application Sep. 6, 1979, Ser. No. 73,245
Claims priority, application Japan, Jun. 10, 1977, 52/69264; Jun. 21, 1977, 52/72881
Int. Cl.[3] F16H *35/18;* H03J *1/00*
U.S. Cl. 74—10.52 5 Claims

1. An indication element driving device for use in a tuning apparatus having a variable capacitor for tuning, a wheel fixed to a rotary shaft of said variable capacitor, a fine cord wound around said wheel to rotate said wheel as it runs, and an indication element fixed to a part of said fine cord thereby to move together with said fine cord thus carrying out tuning indication action, said driving device comprising: a casing of a substantially cylindrical shape of which both end faces are covered; a driving shaft rotatably supported with passing through said covered end faces of said casing and adapted to be shifted in its

axial direction to a first and second position selectively, and briefly rotated upon a tuning operation; a flywheel disposed coaxially with said driving shaft inside said casing and supported rotatably with respect to said driving shaft; a pulley disposed coaxially with driving shaft at an extended part thereof extending and projecting outside said casing and having said fine cord wound therearound; a first clutch which is rendered into its operating state when said driving shaft is set to the first position; a second clutch which is rendered into its



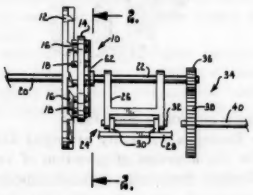
operating state when said driving shaft is set to the second position; and a rotation transmission mechanism which is adapted, when said first clutch is being in its operating state, to speed up the rotation of said driving shaft and to transmit the rotation thus speeded up to said flywheel, and after the rotating manipulation to said driving shaft is released, to transmit the high-speed inertial rotation of said flywheel to said pulley, and when said second clutch is in its operating state, to subject the rotation of said driving shaft to speed reduction and then to transmit the rotation to said pulley.

4,326,431

VARIABLE-SPEED TRANSMISSION DEVICE WITH POSITIVE ACTION

Roger Stephenson, Box 364, Rte. 10, Columbia, Mo. 65201

Filed Mar. 17, 1980, Ser. No. 130,987
Int. Cl.³ F16H *21/14*
U.S. Cl. 74—63 **8 Claims**



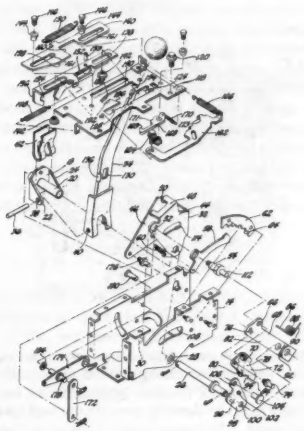
1. A variable speed transmission device comprising:
a first wheel having a front surface carrying a plurality of bars thereon;
a second wheel having a front surface spaced from and facing the front surface of said first wheel, said second wheel having a plurality of openings therein arranged in a circular configuration about the center of the second wheel;
a plurality of pegs in the respective openings projecting beyond said front surface of the second wheel to interact with said bars in a manner to transfer rotation of one wheel into rotation of the other wheel; and
a generally flat spring member on said second wheel having a hub portion and a plurality of extending spring arms contacting the respective pegs in a manner to yieldably urge the pegs generally toward the first wheel to bias the pegs toward the bars.

4,326,432

FLOOR MOUNTED TRANSMISSION SHIFT CONSOLE

Douglas A. Miller, Grand Ledge, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 17, 1980, Ser. No. 141,190
Int. Cl.³ G05G *7/00, 5/18;* E05B *65/12*
U.S. Cl. 74—475 **3 Claims**

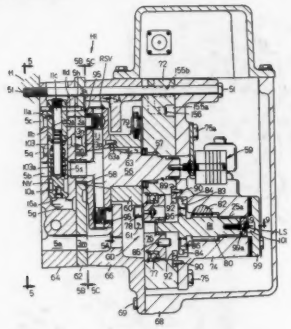


1. A floor mounted transmission shift console for permitting selection of automatic drive ranges including Park (P), Reverse (R), Drive (D), Intermediate (I) and Low (L) in a straight-line movement and for permitting manual shifting to drive ratios including Low, 2nd and 3rd in a modified "H" pattern, said console comprising a stationary base member; a manual lever pivotally mounted on said stationary base member; primary carrier means pivotally mounted on said base member and including a yoke portion which is selectively engageable with said manual lever; transmission control cable means secured to said primary carrier for transmitting control movements to a transmission; secondary carrier means slidably mounted on the base member and including a yoke portion selectively engageable by said manual lever member; link means operatively connected between said secondary carrier and said primary carrier for transmitting and translating linear movement of said secondary carrier to pivotal movement in said primary carrier, cam means formed on said secondary carrier and operating on said link means for moving said primary carrier to the Intermediate (I) range position when the 2nd ratio is selected by positioning the manual lever in one upstanding leg of the "H" pattern and for further moving the primary carrier to the Drive (D) range position when 3rd ratio is selected; said lever undergoes pivotal movement only from the 2nd ratio position to the 3rd ratio position which is a depending leg of the "H" pattern, said lever being movable from any manual position to the corresponding automatic drive position without passing through the Neutral (N) position; and blocker means for preventing movement of the manual lever from the yoke of the primary carrier to the yoke of the secondary carrier except from the low ratio position.

4,326,433
HYDRAULICALLY CONTROLLED POWER TRANSMISSION HAVING FRICTION PLATE CLUTCHES FOR SELECTIVELY ENGAGING A PLURALITY OF CHANGE SPEED GEARS

James B. Black, Roscoe, Ill.; Darwin D. Behlke, Kenosha, and Horst G. Steinhagen, Racine, both of Wis., assignors to Twin Disc, Incorporated, Racine, Wis.

Filed Sep. 7, 1979, Ser. No. 73,508
Int. Cl.[3] F16H *35/00, 5/28*
U.S. Cl. 74—740 8 Claims

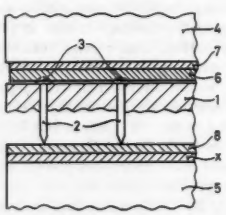


1. A hydraulically controlled transmission having a plurality of selectively engagable change speed gears and also having hydraulically actuated friction type clutches for selectively engaging said gears to thereby provide various speed ratios for said transmission, a hydraulic control circuit in fluid communication with said clutches, a rotary range selector valve in said circuit for distributing pressure fluid to said clutches for actuation thereof, drive means for rotatably driving said rotary selector valve in step-by-step increments whereby said transmission can only be shifted one speed range at a time and an engaged speed range will be released before another speed range is selected, and means for preventing actuation of said selector valve for a range change when said drive means is not in a predetermined position.

4,326,434
PROCESS FOR UNDERLAYING A FLAT-BED STEEL RULE DIE

Heinz Mohr, Speyer; Walter Hoffmann, Frankenthal, and Rudolf Vyvial, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 132,984
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1979, 2913178
Int. Cl.[3] B21K *5/20*
U.S. Cl. 76—107 C 7 Claims



1. A process for underlaying flat-bed steel rule dies of a punch or press having upper and lower platens prior to the production of sheet-like geometrical cut blanks, for example, for folding boxes and similar cuboid containers consisting of paper, cardboard or soft metals, preferably where multi-blank sheets are concerned, so as to compensate for the varying tolerances of the steel-rule cutters in the punching and cutting direction and the different force fluxes of the punching pressure in the cutters plate fitted with the steel rule cutters, said process comprising:

applying to the back of the steel-rule cutter plate, a sheet bonded to a dimensionally stable base, of a flowable plastic, which can be hardened at below 100° C. to give a hard crosslinked plastic, the sheet having a preselected thickness and corresponding in size to the total area of the sheet from which the blanks are to be cut;

then moving the upper and lower platens of the punch or press together, with the steel-rule cutter plate between them so as to emboss a relief on said sheet of flowable plastic;

opening the platens again;

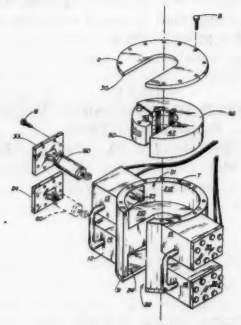
then solidifying the sheet bearing the relief formed therein, by an after treatment outside of the press; and

replacing the sheet between the back of the steel-rule cutter plate and the corresponding platen of the press.

4,326,435
HYDRAULIC POWER TONG

Preston F. Guillot, 132 St. Judge St., Marrero, La. 70072, and Sheldon W. Guthrie, Jr., 428 Willowbrook, Gretna, La. 70053

Filed Jun. 24, 1980, Ser. No. 162,521
Int. Cl.[3] B25B *13/50*
U.S. Cl. 81—57.34 13 Claims



1. A power tong apparatus comprising:

a. a housing having a vertically arranged U-shaped bore allowing for the insertion of a section of vertically supported drill pipe there into, said bore having a vertical axis;

b. upper and lower cylindrical jaw assemblies carried respectively in the upper and lower portion of said housing, and mounted within cylindrical recesses provided respectively in the upper and lower portions of said housing, each of said jaw assemblies comprising:

i. a jaw body having a U-shaped slot and being rotatably supported by said housing;

ii. a movable jaw portion movably mounted on said jaw body;

iii. toothed elements mounted on said jaw body and on said movable jaw, said toothed elements facing inwardly towards said vertical axis;

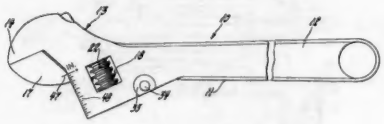
c. hydraulic cylinder means for powering said jaw assemblies in opposite rotational directions; and

d. clamp means associated with each of said upper and lower jaw assemblies for clamping a length of pipe inserted into said slots for rotation with said respective upper and lower jaw assemblies.

4,326,436
COMBINATION ADJUSTABLE/LOCKABLE/MEASURING WRENCH, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Val R. McGraw, 19130 Beaverland, Detroit, Mich. 48219

Filed Sep. 14, 1979, Ser. No. 75,696
Int. Cl.³ B25B *13/16*
U.S. Cl. 81—165 **8 Claims**

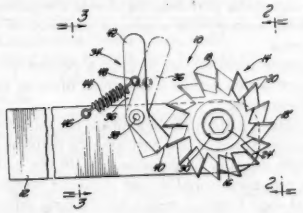


1. A wrench comprising:
a head having a fixed first jaw;
a second jaw movable in said head and having a rack;
a shaft rotatably mounted in said head;
a worm mounted on said shaft for rotation therewith and for meshing with said rack;
means having a preset unlocked position and a preset locked position for selectively unlocking and locking said jaws in any desired position within the range of movement of said second movable jaw;
said shaft and said worm being connected together as an integral unit so as to rotate together as an integral unit and to be locked together as an integral unit and to prevent any slidable movement between said shaft and said worm under all conditions and at all times;
said shaft and worm being completely free to rotate as an integral unit when said means is in its preset unlocked position;
said shaft and worm being locked together as an integral unit to prevent rotation thereof when said means is in its preset locked position;
said means including a brake member operatively cooperating with said rotatable shaft, and a lever connected between said brake member and a translatable push button rod;
said means being configured and arranged to permit operation of said means to its preset locked position and to its preset unlocked position by translation of said push button rod by the same hand of the user which is holding said wrench; and
said brake member being actuatable, by operation of said lever caused by selective translation of said push button rod, to tightly frictionally engage said rotatable shaft to place said wrench in said locked position.

4,326,437
INDEXABLE CUTTING TOOL

Fred W. Fischer, 1450 Silver Bell Rd., Rochester, Mich. 48063

Filed Jul. 28, 1980, Ser. No. 173,026
Int. Cl.³ B23B *29/00*; B26D *1/12*
U.S. Cl. 82—36 A **5 Claims**

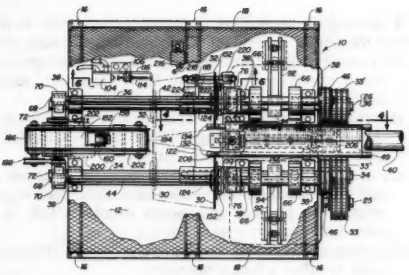


1. A cutting tool assembly comprising tool holder means, a cutting tool including a tool body having a plurality of substantially identical cutting edges extending radially from said tool body and being substantially equally circumferentially spaced thereabout, each of said cutting edges having a back face portion, mounting means pivotally mounting said tool body on said tool holder means about a first pivot axis for pivotal indexing movement of said tool body relative to said tool holder means to successively dispose a selected one of said cutting edges in a predetermined cutting position relative to said tool holder means, latch means pivotally mounted on said tool holder means about a second pivot axis spaced from said first pivot axis and having a latched position operatively engageable with said back face portion of a cutting edge remote from said selected one of said cutting edges to hold said selected one of said cutting edges in said predetermined cutting position and an unlatched position permitting pivotal indexable movement of said tool body to dispose another of said cutting edges in said predetermined cutting position, and yieldable means operatively interconnecting said tool holder means with said latch means to continuously urge the latter toward said latched position thereof while permitting movement of said latch means to said unlatched position thereof while indexing said tool body.

4,326,438
CUTOFF MACHINE FOR NON-METALLIC TUBE STOCK

George B. Ballerstein, York, and Spurgeon E. Kimmel, Wellsville, both of Pa., assignors to Yorktowne Paper Mills, Inc., York, Pa.

Filed Dec. 15, 1980, Ser. No. 216,624
Int. Cl.³ B23B *37/00*
U.S. Cl. 82—53.1 **20 Claims**



1. A cutoff machine for cutting uniform lengths of non-metallic tube stock into desired lengths immediately upon formation thereof by rotation on a winding machine and comprising in combination,
a. a frame having inlet and discharge ends and means to support said tube stock at said inlet end,
b. a pair of parallel drive shafts mounted for rotation in opposite directions on said frame at opposite sides of said tube stock,
c. a pair of disc saws respectively mounted upon said shafts in a common vertical plane transverse to said tube stock and driven thereby for rotation downward into opposite sides of said rotating tube stock,
d. motor means connected to said drive shafts to drive the same in opposite direction toward each other,
e. means supporting said drive shafts and saws for transverse movement toward and from each other for insertion and withdrawal of said saws relative to said tube stock,
f. first power means to move said saws longitudinally along said drive shafts from a starting position at the same speed as said tube stock and return said saws to said starting position,
g. second power means connected to said means supporting

said drive shafts and saws for said transverse movement toward and from each other, and

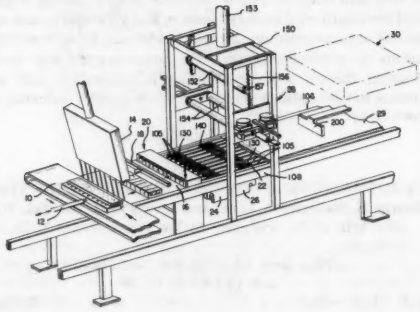
h. control means for said second power means operable to effect said transverse movement of said shafts and saws from each other prior to operation of said first power means to return said saws to said starting position.

4,326,439

APPARATUS AND METHOD FOR STACKING AND FACING UNCURED BRICK

Bob L. Frost; Harry D. Leeds, and Joseph E. Eckart, all of Clarksville, Ark., assignors to Clarksville Machine Works, Inc., Clarksville, Ark.

Filed Mar. 26, 1980, Ser. No. 134,025
Int. Cl.³ B28B *13/00*
U.S. Cl. 83—27 **10 Claims**



8. Method of cutting and arranging unfired bricks in preparation for setting onto a kiln car comprising the steps of:

(a) passing slugs of unfired clay sidewise through a wire cutter one layer at a time to form successive, adjacent, abutting single layer rows of cut brick;

(b) forming a spaced double layer stack by lowering one row then moving a succeeding row into superposed relation in spaced relation above said first row;

(c) transferring both layers in said sidewise direction from said superposed spaced relation into superposed engaging relation by pushing both layers simultaneously in said sidewise direction;

(d) lifting and inverting the upper layer of said double layer stack to effect a facing operation.

4,326,440

METAL CUTTING MACHINES

Michel Harmant, Neris-les-Bains, France, assignor to Ems Industrie, Montlucon, France

Filed Nov. 20, 1979, Ser. No. 96,144
Claims priority, application France, Nov. 22, 1978, 78 32928
Int. Cl.³ B26D *1/00, 7/00;* B29H *17/00*
U.S. Cl. 83—482 **4 Claims**

1. In a cutting machine having a cutter bar supporting a strip to be cut, a cutting carriage comprising:

a mobile cutting assembly freely rotatable in a cylinder;

contact rollers at said carriage for travelling over two prismatic rails for prismatic guiding of said carriage;

two coaxial bores provided in part of said carriage;

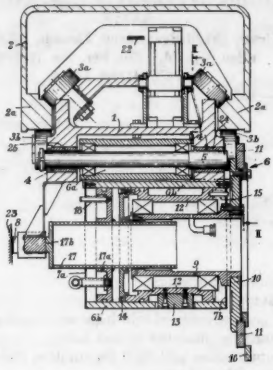
a shaft for pivotally supporting said mobile assembly in said bores;

pressure members for resiliently urging said assembly, during cutting travel, towards the cutter bar;

said pressure members constituting a pneumatic jack embodying said cylinder, a sleeve shaped piston, a hollow shaft rotatable in said piston and a circular flange carried by said shaft and arranged to hold a cutting knife;

a second piston slidable in said cylinder in coaxial relationship with and operatively opposed to said sleeve shaped piston;

a pressure plate fixed to said second piston;



return springs for spacing said piston and thereby spacing said knife from the cutter bar during return travel of the cutting carriage; and

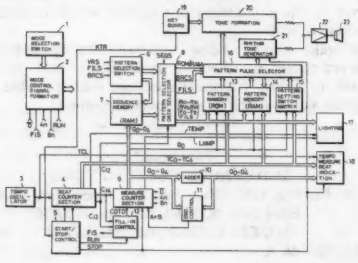
means for transmitting cutting reaction to rollers travelling over a rail parallel to the cutter bar.

4,326,441

AUTOMATIC PERFORMANCE DEVICE

Akio Imamura, and Akiyoshi Oya, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 15, 1980, Ser. No. 140,484
Claims priority, application Japan, Apr. 19, 1979, 54-48277
Int. Cl.³ G10H *1/42, 7/00*
U.S. Cl. 84—1.03 **28 Claims**



1. An automatic performance device comprising:

a pattern memory for storing a plurality of performance patterns;

a sequence memory for storing a pattern progression sequence which defines a sequential order of the patterns to be performed;

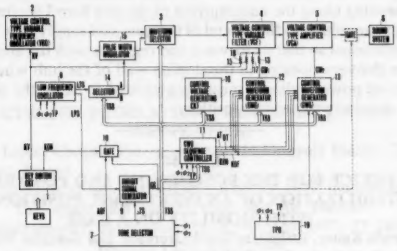
performance pattern reading means for successively reading respective ones of said performance patterns stored in said pattern memory in accordance with the pattern progression sequence stored in said sequence memory; and

musical tone forming means for forming musical tones for automatic performance in accordance with the performance patterns read out of said pattern memory.

4,326,442
ELECTRONIC MUSICAL INSTRUMENTS WITH TONE COLOR SELECTION

Hideo Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1980, Ser. No. 125,171
Claims priority, application Japan, Feb. 28, 1979, 54-22858
Int. Cl.³ G10H *1/06, 1/22*
U.S. Cl. 84—1.19 **5 Claims**



1. An electronic musical instrument comprising:
(a) a plurality of depressible keys;
(b) key switch means responsive to the depression and release of a key among said keys for generating a keying signal;
(c) first means operatively connected to said key switch means for generating a musical tone signal for said keying signal;
(d) second means operatively connected to said first means for generating a musical tone corresponding to said musical tone signal;
(e) a plurality of tone color selection switches having on and off states, said tone color selection switches generating tone color signals, each said tone color signal specifying a tone color for a musical tone signal;
(f) tone color means responsive to a selected one of said tone color signals for imparting tone color to said musical tone generated by said second means, said tone color specified by said selected tone color signal;
(g) first detection means operatively connected to said tone color selection switches for detecting a variation in said states of said tone color selection switches, said detection means generating a detection signal when a state of any one of said tone color selection switches varies, said detection signal being common to all said tone color selection switches and separate from said tone color signals;
(h) means responsive to said detection signal for generating a tone inhibit signal of selected duration; and
(i) means responsive to said inhibit signal for preventing generation of said musical tone for a time period determined by said duration of said inhibit signal.

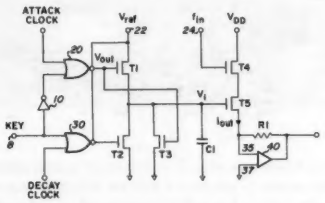
4,326,443
INTEGRATED ORGAN CIRCUIT

Richard W. Bryant, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 1, 1980, Ser. No. 145,415
Int. Cl.³ G10H *1/02*
U.S. Cl. 84—1.26 **8 Claims**

1. An MOS integrated organ circuit having a digital interface for communicating with other integrated circuits, the digital interface characterized by logic signals having voltages substantially equal to either a supply voltage or a ground voltage, and having a keyer circuit for providing an output signal characterized by a maximum amplitude, an attack time and a decay time in response to a key signal and a tone signal, the integrated organ circuit comprising:

variable reference means for providing a variable reference voltage;
first gate means coupled to receive the key signal and the variable reference voltage for providing an attack signal in response to the key signal having a first amplitude, the amplitude of the attack signal being responsive to the amplitude of the variable reference voltage;
second gate means coupled to receive the key signal and the variable reference voltage for providing a decay signal in response to the key signal having a second amplitude, the amplitude of the decay signal being responsive to the amplitude of the variable reference voltage:



a first transistor having a drain coupled to a source of voltage, a gate coupled to the first gate means to receive the attack signal and a source;
a second transistor having a drain coupled to the source of the first transistor, a gate coupled to the second gate means to receive the decay signal, and a source coupled to the ground voltage;
capacitance means for providing a capacitance between the source of the first transistor and the fixed ground voltage; and
a third transistor, having a gate coupled to the source of the first transistor, a drain coupled to receive the tone signal and a source for providing the output signal.

4,326,444
MUSICAL INSTRUMENT STRING

Donald D. Markley, 2610 Northwood Dr., San Jose, Calif. 95132

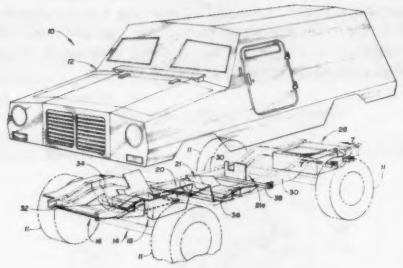
Filed May 19, 1980, Ser. No. 151,147
Int. Cl.³ G10D *3/10*
U.S. Cl. 84—297 S **11 Claims**

1. A musical instrument string comprising:
means forming a central core for a wound guitar string, the core having a length extending between spaced ends and one or more lengths of wire forming helically wound layers along the length of said central core thereby forming a round wound base string, the outer surface of said base string being unaltered along a first portion of its length extending from one of said ends to a mid area of said length, and a substantial remaining portion of said length extending from said first portion to the other of said ends being modified so as to have a relatively smooth outer surface.

4,326,445
ARMORED UNDERBODY FOR ROAD VEHICLE

James M. Bemiss, St. Clair Shores, Mich., assignor to Cadillac Gage Company, Warren, Mich.

Filed Mar. 19, 1980, Ser. No. 131,584
Int. Cl.³ F41H 5/00
U.S. Cl. 89—36 F 20 Claims

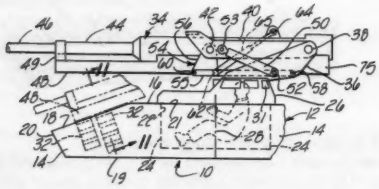


1. An armored underbody for a road vehicle, the underbody comprising: a pair of longitudinal frame members spaced laterally from each other; a plurality of armor protection plates mounted below vehicle underbody components to provide radiator, engine, transmission, and transfer case protection from upwardly directed projectiles; each armor protection plate having front and rear ends for mounting thereof; a vehicle floor including separate front and rear floor sections of armor plate for protecting the vehicle occupant compartment from intrusion by upwardly directed projectiles; a floor support member extending laterally between the longitudinal frame members so as to be supported thereby; said front and rear floor sections being secured to said floor support member; and a fuel tank fabricated from armor plate to prevent puncturing therof by projectiles, said fuel tank including a pair of vertical side walls respectively mounted on the longitudinal frame members, and the fuel tank also including front, bottom, rear, and top walls extending between the side walls to enclose the tank.

4,326,446
LINKAGE OF ACTUATING SYSTEM FOR ELEVATING GUN MOUNT

Roland A. Magnuson, Seattle, Wash., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 19, 1979, Ser. No. 95,746
Int. Cl.³ F41H 7/06
U.S. Cl. 89—38 3 Claims

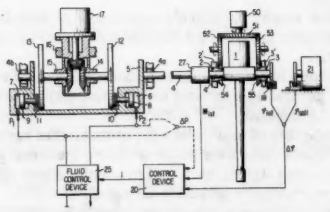


1. A military vehicle comprising a hull, a man-accommodating turret mounted on the hull for rotatable movement in the azimuth plane; a gun located about the turret to normally assume a level attitude; a gun elevating lever having a first pivot connection with the turret and a second pivot connection with the gun; first fluid power cylinder means trained between the turret and the gun elevating lever for swinging said lever around the first pivot connection, thereby, changing the elevation point of the second pivot connection, a toggle linkage pivotably trained between the turret and the second pivot connection; a second fluid power cylinder means pivotably trained between the toggle linkage and the gun for swinging said gun around the second pivot connection; said hull having at its frontal end an upper wall that slopes downwardly and forwardly; ammunition storage means within the hull beneath the sloping wall; an ammunition delivery opening in the sloping wall; said gun having at least one ammunition supply tube extending along the undersurface of the gun barrel for delivering ammunition to the aft end of the gun; said supply tube being dimensional so that its forward end registers with the ammunition delivery opening in the sloping wall of the hull when the second power cylinder means is activated to move the gun to an angularly depressed position.

4,326,447
DEVICE FOR THE POSITIONING AND POSITION STABILIZATION OF AN INERT MASS, POSITIONED WITH MOBILITY ON A BASE

Harald Kauer, Ettlingen; Knud Overlach, and Joachim Wilken, both of Karlsruhe, all of Fed. Rep. of Germany, assignors to Dr.-Ing. Ludwig Pietzsch, Karlsruhe, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 349,660, Apr. 3, 1973, abandoned. This application Aug. 8, 1975, Ser. No. 603,594
Int. Cl.³ F41G 5/24
U.S. Cl. 89—41 H 7 Claims



1. A system for positioning and stabilizing the aim of a barrelled weapon on a carrier subject to movement over an uneven supporting surface comprising:

base means supported on said carrier for movement therewith;

bearing means supporting said weapon on said carrier for pivot movement about the axis of said bearing means in such manner that inertia of said barrelled weapon normally maintains said weapon in a preselected aiming position in one degree of freedom despite movement of the carrier in that degree of freedom;

positioning means for controlling the aim of said weapon in said degree of freedom comprising:

a first means including driven means and a second means normally uncoupled to said first means but selectively couplable thereto to be driven in either of opposite directions thereby,

said first means including a pair of axially aligned disks mounted for rotation in opposite directions and said second means including a pair of friction pads mounted for individual actuation depending upon the direction of corrective movement desired,

said first means being supported on one of either said barrelled weapon or said base means, and said second means being supported on the other of said barrelled weapon or said base means so that said first and second means are normally supported solely by said bearing means to allow free pivotal movement between said weapon and said base means in said one degree of freedom;

means to represent the desired aim of said weapon on said base means in said degree of freedom; and,

means responsive to a difference between the desired aim and the actual position of the weapon on said base means in said degree of freedom for coupling said first means and said second means of said positioning means during only such periods as are necessary to bring said weapon to the desired position in said degree of freedom.

4,326,448

ELECTRONIC REGULATION PROCEDURES USING A SERVOMOTOR

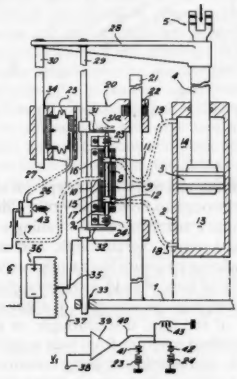
Jean Lejon, Choisel, France, assignor to Controle Bailey, Clamart, France

Continuation of Ser. No. 907,497, May 19, 1978, abandoned. This application Apr. 29, 1980, Ser. No. 144,907

Claims priority, application France, Aug. 10, 1977, 77 24600

Int. Cl.³ F15B *9/03, 9/09*

U.S. Cl. 91—363 R **7 Claims**



1. An electropneumatic apparatus comprising:

a jack assembly having a movable piston and rod;

a movable memory plate with position maintaining friction means;

potentiometer means for indicating the position of said plate at all times;

a pneumatic valve mounted on the memory plate, the pneumatic valve controlling the jack assembly to maintain it at a reference position established by the memory plate as indicated by the potentiometer means;

means for mechanically connecting the rod of the movable piston to the pneumatic valve, said means for connecting having a mechanical flexibility permitting slight temporary displacements of the movable piston relative to the plate which carries the pneumatic valve;

pneumatic clutch means for displacing the memory plate to change from said reference position to another reference position, said pneumatic clutch means being interconnected between the rod of the motor piston and said memory plate wherein actuation of the pneumatic clutch means mechanically connects, for concurrent movement, the rod to the memory plate; and

valve actuating means for eliminating the controlling effects of the pneumatic valve, said valve actuating means acting simultaneously with the actuation of said pneumatic clutch means.

4,326,449

DOUBLE ACTING HYDRAULIC JACK WITH AN END OF STROKE DEVICE

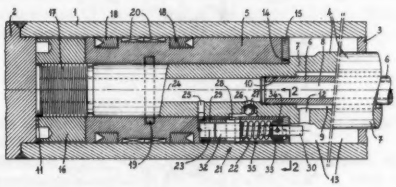
Raymond Perraud, Villeurbanne, France, assignor to Societe d'Etude et de Construction de Machines pour Toutes Industries S.E.C.O.M.A., Societe Anonyme, Meyzieu, France

Filed Mar. 25, 1980, Ser. No. 133,831

Claims priority, application France, Apr. 6, 1979, 79 09554

Int. Cl.³ F15B *15/22*

U.S. Cl. 91—401 **7 Claims**



1. In a double-acting hydraulic in combination with an end-of-stroke device, said jack having a cylinder, a piston slidable in the cylinder to vary the volume of first and second chambers at opposite sides of said piston in the cylinder, said jack being supplied with hydraulic fluid through a piston rod connected to said piston, the improvement wherein said piston is provided with a bore, the axis of said bore being parallel to the axis of the jack, a permanently open first conduit arrangement between an end of the bore and a passage in the rod through which passage hydraulic fluid is supplied to the first chamber, a second conduit arrangement between a central region of the bore and the passage, the second conduit arrangement being provided with a non-return valve to prevent the flow of hydraulic fluid from the bore to the passage, a permanently open third conduit arrangement between the second chamber and a region of the bore opposite said end of the bore, a sleeve mounted to slide in the bore to close and open an outlet which opens into the bore from the second conduit arrangement, a second rod mounted to slide along the axis of the bore, the second rod passing through an opening connecting the bore to the second chamber, said second rod comprising a head mounted to slide inside the sleeve, a helical spring disposed around the second rod and interposed between the sleeve and an abutment fixed to the second rod, and an end of said second rod passing through the said opening and being able to come into abutment with an end of the cylinder located adjacent the second chamber when the jack is in an end-of-stroke position.

4,326,450

FLUID MECHANISM WITH AXIALLY MOVABLE VALVE-SEAT

Serge B. Bacquie, La Croix Saint Ouen, France, assignor to Poclain Hydraulics, Verberie, France

Filed Feb. 28, 1980, Ser. No. 125,534

Claims priority, application France, Mar. 1, 1979, 79 05409; Jan. 10, 1980, 80 00532

Int. Cl.³ F01B *13/06*

U.S. Cl. 91—487 **10 Claims**

1. A fluid mechanism including,

a cam,

a cylinder block mounted for rotation about an axis with respect to the said cam, and including a plurality of cylinders,

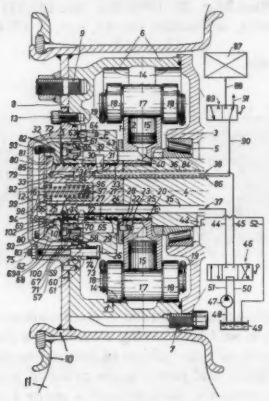
a plurality of pistons, each one being mounted for sliding in one of the said cylinders and being operatively associated with said cam,

said cylinder block including a cylinder pipe, each cylinder pipe, connecting one of said cylinders to a transverse face of said cylinder block,

a valve-seat,

said valve seat is axially movable with respect to said cam and immovable with respect to rotation of said cam,

said valve seat operatively connected to a supply pipe supplying the mechanism with pressurized fluid and an exhaust pipe for removing said fluid,



said valve seat including a means and capable of moving said valve seat to position said transverse face of said valve seat in said abutting position with said transverse face of said cylinder block,

activation means for activating said control means to move said valve seat.

4,326,451

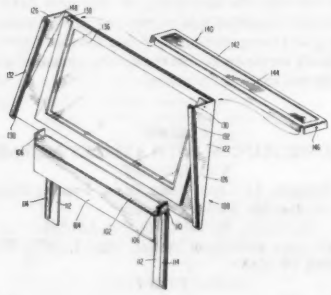
ATTACHMENT FOR MOTOR VEHICLES WITH REAR WINDOWS

Richard Chatlos, Johnstown, Pa., assignor to Air O Scoop Corporation, Johnstown, Pa.

Filed Feb. 4, 1980, Ser. No. 118,444

Int. Cl.³ B60J *1/20*

U.S. Cl. 98—2.12 **16 Claims**



1. An air flow device for a closed motor vehicle or boat for positioning in the rear aperture thereof which comprises (i) means for attaching said air flow device to said rear aperture, said attachment means including (a) a top elongated flat base member, (b) a first downwardly-positioned flat member attached to one elongated side of said base member and (c) a second downwardly-positioned flat member attached to the other elongated side of said base member, said attachment means tightly fitting over the lower rim of said rear aperture, (ii) a plate, which is attached at its bottom to the inner elongated edge of the top elongated flat member and extends upwardly and inwardly therefrom, thereby forming a gap between the top of said plate and the vertical plane of said rear aperture, and said plate having a central aperture, (iii) a transparent plate which is mounted on said plate and covers said central aperture, and (iv) two side members, each of which is attached to an end of said plate, thereby preventing lateral air flow.

4,326,452

FLUID DIVERTING ASSEMBLY

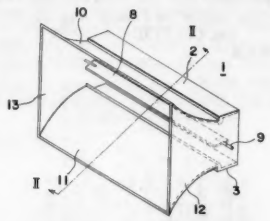
Motoyuki Nawa; Norio Sugawara, and Yutaka Takahashi, all of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 19, 1978, Ser. No. 953,968

Claims priority, application Japan, Oct. 24, 1977, 52-128035; Oct. 24, 1977, 52-128036; Oct. 24, 1977, 52-128038; Nov. 8, 1977, 52-134216; Aug. 31, 1978, 53-107129; Aug. 31, 1978, 53-107131; Aug. 31, 1978, 53-107138

Int. Cl.³ F24F *7/00*; B05B *1/14*

U.S. Cl. 98—40 VT **23 Claims**



1. A fluid deflecting assembly of the type for confining the flow of fluid therethrough to flow in only two dimensions, said assembly comprising: a nozzle means for issuing a main stream of fluid as the fluid passes therethrough, said nozzle means having a nozzle defining structure with a relatively small thickness in the direction of flow of fluid therethrough as compared with the width thereof in the direction at right angles to the direction of flow of the fluid therethrough; an outlet means through which the fluid emerges from said nozzle, said outlet means connected to said nozzle and being constituted by a pair of spaced opposed guide walls having a shape diverging from each in a direction downstream with respect to the direction of flow of a stream of fluid issuing from said nozzle and opening outwardly in a direction away from said nozzle and at least the upstream portions thereof being curved; there being a substantially abrupt dicontinuity between the curvature of said nozzle defining structure at the exit end thereof and the upstream ends of said guide walls which constitutes a detachment region; and a deflecting blade mounted in said assembly with the upstream and downstream edges respectively upstream and downstream of said nozzle and for rotation between a position perpendicular to the plane of the nozzle opening and first and second extreme positions on opposite sides of and at an angle to said perpendicular position and at which said blade is spaced from the nozzle defining structure for dividing the fluid medium flowing through said assembly into two fluid currents at all positions of said blade and, when the blade is in a position other than said perpendicular position, said blade diverts the current on the side of the blade toward which the downstream end of the blade has been deflected, said guide walls being positioned sufficiently close to the path of the diverted current for causing the diverted current to adhere to the curved guide wall to which it has been diverted said discontinuity and said blade cooperating to direct the current on the other side of said blade into said diverted current and then to facilitate adjoinment of both said currents to thereby control the direction of flow of the fluid stream emerging from said outlet means.

17. A fluid deflecting assembly comprising: a nozzle means for issuing a main stream of fluid as the fluid passes there-

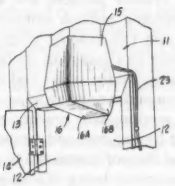
through, said nozzle means having a nozzle defining structure with a relatively small thickness in the direction of flow of fluid therethrough as compared with the width thereof in the direction at right angles to the direction of flow of the fluid therethrough; an outlet means through which the fluid emerges from said nozzle, said outlet means connected to said nozzle and being constituted by a pair of spaced opposed guide walls having a shape diverging from each other in a direction downstream with respect to the direction of flow of a stream of fluid issuing from said nozzle and opening outwardly in a direction away from said nozzle and at least the upstream portions thereof being curved; and a deflecting blade mounted in said assemble with the upstream and downstream edges respectively upstream and downstream of said nozzle and for rotation between a position perpendicular to the plane of the nozzle opening and first and second extreme positions on opposite sides of and at an angle to said perpendicular position and at which said blade is spaced from the nozzle defining structure for dividing the fluid medium flowing through said assembly into two fluid currents at all positions of said blade and, when the blade is in a position other than said perpendicular position, diverting the current on the side of the blade toward which the downstream end of the blade has been deflected, said guide walls being positioned sufficiently close to the path of the diverted current for causing the diverted current to adhere to the curved guide wall to which it has been diverted and to direct the current on the other side of said blade into said diverted current and then to facilitate adjoinment of both said currents to thereby control the direction of flow of the fluid stream emerging from said outlet means for detecting a change in the magnitude of a parameter in response to which the direction of flow of the fluid stream is desired to be changed, a drive source connected to said detecting means and responsive to a signal generated from said detecting means for producing a drive force for rotating the deflecting blade between said first and second extreme positions, and means for coupling said drive source to said blade.

4,326,453

AIR TRANSFER DEVICE

John A. LaBoda, Fairview Park, and Paul R. Fortlage, Sharon Center, both of Ohio, assignors to MTD Products Inc., Cleveland, Ohio

Filed Oct. 24, 1980, Ser. No. 200,420
Int. Cl.³ F24F *13/08*
U.S. Cl. 98—87 **1 Claim**



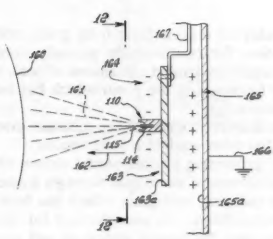
1. A device for transferring air from the upper portion of a room to an exterior space through an open doorway leading from the said room to said exterior space, the room having a wall portion above the said open doorway, comprising in combination a conduit adapted to be mounted in said room to the said wall portion above the said open doorway, said conduit having an upwardly directed open upper end through which air may flow downwardly and enter the conduit from the upper portion of the room and an open bottom end through which air in the conduit may escape, said open upper end and said open bottom end being in axial vertical alignment, an electric fan mounted in said conduit in position to draw air from siad upper portion of the room into the conduit through said open upper end thereof, the fan rotating on an axis parallel to said vertical alignment of said upper and lower open ends, said fan being adapted to be connected by an electrical circuit to a source of electrical energy, and a chute disposed at the open bottom end of the conduit and hingedly connected thereto along a pivot line on a side of the conduit farthest from said wall portion above said doorway, said chute upon being hingedly swung upwardly toward said conduit being disposed laterally across said open bottom end and clearing the doorway to permit the movement of a door to and from the doorway, said chute upon being hingedly swung downwardly away from said conduit at an acute angle to said conduit to be inclined downwardly and toward said open doorway being disposed to divert air moving downwardly through the conduit and out of the open bottom end thereof to flow through the open doorway into said exterior space.

4,326,454

ION TREATMENT ENHANCEMENT

Donald G. Saurenman, Cerritos, Calif., assignor to Consan Pacific Incorporated, Whittier, Calif.

Continuation of Ser. No. 81,774, Oct. 4, 1979, abandoned, which is a continuation-in-part of Ser. No. 13,786, Feb. 21, 1979, Pat. No. 4,250,804, which is a continuation-in-part of Ser. No. 893,003, Apr. 3, 1978, abandoned. This application Apr. 6, 1981, Ser. No. 251,275
Int. Cl.³ A23L *3/32*; A23B *4/04*
U.S. Cl. 99—451 **28 Claims**



1. In apparatus for enhancing ion treatment of objects, the combination including

(a) means for

(i) dispersing smoke particles in a zone wherein the objects are located,

(ii) and for inducing smoke particle flow to contact exposed undersides of the objects, and to flow around and above the objects,

(b) means including a source of high voltage and multiple pointed tips to which said voltage is applied for forwardly dispersing charged ions into the smoke flowing upwardly above the objects with the ions carrying an electrical charge or charges causing smoke particles to be attracted back downwardly onto upper sides of the objects,

(c) and metallic structure having local contact with exposed underside portions of the objects, said structure imparting a potential to the objects to cause said smoke particles into which ions have been dispersed to be attracted to the upper sides of the objects,

(d) said tips arranged in spaced apart groups and pointed generally toward the objects so that the ions being dispersed enhance smoke particle flow onto the objects,

(e) said metallic structure including metallic surface structure supporting the objects, said surface structure being electrically conductive, and

(f) the smoke being dispersed by said first means into a lower region of said zone lower than the objects, and the ions are dispersed by said tips into an upper region of said zone higher than the objects, said smoke particle flow inducing means located in and openly exposed in said zone to displace the smoke and ions above the levels of the objects,

and in directions and at rates sufficient to enhance smoke particle flow onto the objects,

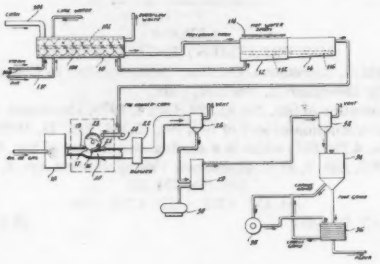
(g) and means forming a surface located in rearward proximity to said tips to provide distributed electrostatic charge at said surface and of the same polarity as said ions, thereby to enhance the forward dispersing of said ions.

4,326,455

CONTINUOUS PRODUCTION OF GRAIN PRODUCTS

Manuel J. Rubio, 192 Benham Ave., Bridgeport, Conn. 06605

Filed Mar. 22, 1979, Ser. No. 22,788
Int. Cl.³ B02B *1/04, 7/02*
U.S. Cl. 99—483 **5 Claims**



1. Apparatus for making flour from grain, comprising

a pre-cooker for continuously partially cooking grain in water under controlled conditions of heat, time and pH,

a washer for washing the grain which has been cooked in said pre-cooker,

a pre-conditioner to stabilize the moisture content of grain, which has been washed in said washer,

means for producing a super-heated stream of air and causing said stream of air to pass through a conduit,

a mill for reducing said grain which has been processed in said preconditioner to particles and for introducing said particles into the central region of said stream of superheated air as it travels through

a conduit of desired configuration, wherein said mill comprises a roll, an unobstructed portion of the face of which is so positioned as to be impinged-upon by said stream of air and normally turns so that said portion of said face of said roll moves in the direction of travel of said stream of air, said conduit being adjacent said mill, and

means for discriminating particles larger in size than a predetermined dimension from those which are smaller and for accumulating said smaller particles.

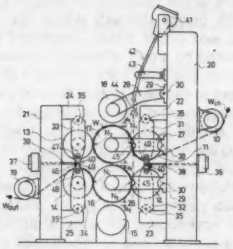
4,326,456

METHOD AND APPARATUS FOR CALENDERING PAPER WEBS OR THE LIKE

Matti Kankaanpaa, Espoo, Finland, assignor to Valmet Oy, Finland

Filed Sep. 29, 1980, Ser. No. 192,026
Claims priority, application Finland, Oct. 15, 1979, 793201
Int. Cl.³ B30B *3/04*
U.S. Cl. 100—41 **17 Claims**

1. A method for calendering a paper web or the like in calendering apparatus including a plurality of hard calendering rolls and a plurality of soft calendering rolls, which hard and soft rolls are situated with respect to each other to define a plurality of hard nips and a plurality of soft or supercalendering nips, comprising the steps of: initially situating said hard and soft rolls with respect to each other prior to the start-up phase of the operation of the calendering apparatus so that the hard nips defined by the hard rolls are closed and so that the supercalendering nips defined by soft roll pairs with respective hard rolls are open, threading the paper web during the start-up phase of operation through the closed hard nips and open supercalendering nips; situating said hard and soft rolls with respect to each other at the end of the start-up phase of the operation so that substantially all of the hard nips are open and



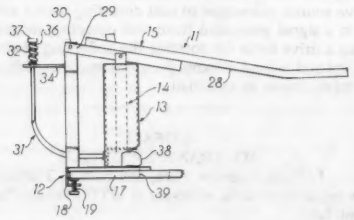
so that the supercalendering nips are closed; and operating the calendering apparatus in a continuous phase operation to perform continuous supercalendering of the paper web.

4,326,457

CAN CRUSHING APPARATUS

George A. Sather, Box 217, Soquel, Calif. 95073

Filed May 27, 1980, Ser. No. 153,835
Int. Cl.³ B30B *9/32, 15/32*
U.S. Cl. 100—218 **8 Claims**



1. Can crushing apparatus including a base portion, a can holding portion, a crusher portion, and a crusher actuating portion; said can holding portion extending upwardly from said base portion, said can holding portion including a can retaining section, said can retaining section including a can receiving opening adjacent the upper end of said can retaining section, a crushed can outlet opening adjacent the lower end of said can retaining section; said crusher portion including a piston, a piston rod having one end connected to said piston and the opposite end thereof connected to said crusher actuating portion, said piston rod being of a length greater than the length of said can retaining section; said crusher actuating portion including a support section extending upwardly from said base portion adjacent to said can retaining section, a handle member having one end thereof pivotally connected to the upper end of said support section and extending from said support section over the upper end of said can retaining section and substantially beyond said can retaining section, the upper end of said piston rod being pivotally connected to said handle member along the length thereof, said handle member being pivotable about its pivot point with said support section from a position adjacent said can retaining section in which said piston is disposed adjacent said outlet opening of said can retaining section to a position remote from said can retaining section in which said piston is spaced from said can receiving opening of said can retaining section, and means for ejecting a crushed can from said outlet opening including a movable member having one end thereof adjacent to said outlet opening

of said can retaining section and the opposite end thereof adjacent to the upper end of said support section.

4,326,458

PRINTING APPARATUS

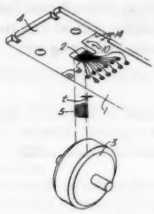
William L. Ross, Nr. Uckfield, England, assignor to Sign Electronics Limited, Middlesex, England

Filed Jul. 11, 1980, Ser. No. 168,761

Claims priority, application United Kingdom, Jul. 19, 1979, 25252/79

Int. Cl.³ G01D *15/06*

U.S. Cl. 101—1 **18 Claims**



1. In a printer of the type in which print is formed on a drum by an electrostatic process and is transferred therefrom onto a print receiving surface of a print medium by means solely of pressure acting between the print medium and the drum an improved print head comprising in combination:

(a) housing means;

(b) a print drum supported for rotation about an axis in said housing means, said print drum having a cylindrical surface formed by a uniform dielectric layer on a conductive cylindrical former, and said housing means incorporating a printing station at which the print is transferred to said print medium;

(c) means for connecting said conductive former to a first potential source;

(d) an image forming means positioned in said housing means adjacent said drum and at a position spaced circumferentially with respect to the printing station, said image forming means comprising an array of conductors extending normally to a first plane containing the axis of rotation of the drum and in a second parallel to a tangent of said drum, each conductor of said array being for connection to a respective pulse source means, and further comprising an elongate electrode means having a first end in contact with each of the conductors of said conductor array and a second end extending along a line parallel to the drum axis in direct physical contact with the dielectric layer on the periphery of the drum, said electrode means comprising a strip of an elastomeric material in the form of a laminate having alternating electrically conductive and non-conductive layers, each layer mounted to respectively extend between said array of conductors and said drum in a plane normal to the axis of the latter, and having a structure which is finely divided in relation to the structure of said array of conductors;

(e) means for detecting the angular displacement of the drum due to rotation thereof in the housing;

(f) means connected to said respective pulse source means and to said means for detecting the angular displacement of the drum for selectively enabling the pulse source means whereby the conductors are pulsed in a prescribed sequence with a voltage signal derived from a second potential source in response to the angular displacement of the drum so as to form a charge image of one or more preselected characters on said dielectric surface; and

(g) inking means positioned in said housing means adjacent the said drum and between the image forming means and the printing station, said inking means including means for supplying ink and means for applying said ink to the drum after said charge image has been formed and before the charge image has reached the printing station as a result of rotation of the drum whereby print corresponding to one or more characters is formed by ink adhering to the charged areas on the dielectric surface of the drum, said ink applying means comprising at least one electrode means for connection to a third potential source which is spaced from said drum and is arranged so that the electrostatic field which is formed as each charge image passes the electrode means causes transfer of ink from the ink applying means to the areas on the drum on which the charge defining the charge image is confined.

4,326,459

HAMMER LOCK RELEASING MECHANISM FOR A PRINTING DEVICE

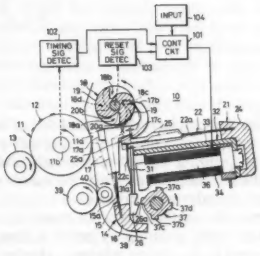
Takayuki Iwao, Chofu; Takemitsu Ono, Machida, and Yukio Ishikawa, Yamato, all of Japan, assignors to Mitsumi Electric Co., Ltd., Chofu, Japan

Filed Oct. 24, 1979, Ser. No. 87,956

Claims priority, application Japan, Jan. 25, 1979, 54/8067[U]

Int. Cl.³ B41J *9/32*

U.S. Cl. 101—93.30 **7 Claims**



1. A hammer lock releasing mechanism for a printing device comprising:

a rotary type wheel provided on its outer surface with a plurality of types disposed at equal angular intervals and in at least one column, and driven in rotation at a specific speed;

a printing hammer head disposed confronting said type wheel and undergoing displacement, in printing operation, to strike a desired type selectively onto a sheet of paper thereby to carry out printing, said sheet of paper being fed between said hammer head and said types;

means for urging said hammer head to move in the direction of carrying out printing action;

a mechanism for locking said hammer head in a non-printing position, said mechanism comprising a locking member for locking said hammer head and a first spring means for urging said locking member so as to make locking operation; and

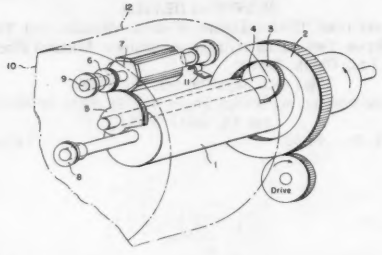
a mechanism for releasing said hammer head from its locked state by means of said locking mechanism, said releasing mechanism comprising an electromagnet means, a second spring means operatively connected to said locking member and facing said electromagnet means in spaced-apart relation, said second spring means being displaced exclusively laterally relative to said electromagnet means upon energization of said electromagnet means, a catch member carried by said second spring means and which is displaced in unison therewith, and means rotating correspondingly with the rotation of said type wheel having members engageable with said catch member upon said displacement of said catch members and which move the assembly of said catch member, said second spring means and said locking member longitudinally in a direction to

release said hammer head upon energization of said electromagnet means.

4,326,460
INDICATING DEVICE FOR AN OPTION PRINTING CYLINDER

Klaus Nückel, Mülheim am Main, Fed. Rep. of Germany, assignor to Postalia GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Aug. 5, 1980, Ser. No. 175,447
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1979, 2932426
Int. Cl.³ B41J *1/60*
U.S. Cl. 101—110 **6 Claims**

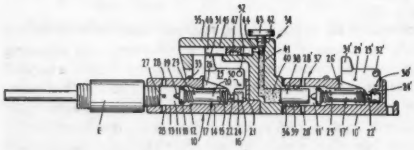


1. Device for indicating types of mail for an option printing cylinder in franking machines, comprising side plates disposed on the option printing cylinder, another printing cylinder supported between said side plates in the option printing cylinder, a toothed cylinder gear connected to said other printing cylinder, means for setting different types of printing upon rotation of said other printing cylinder, a first shaft at least partially disposed in the option printing cylinder, a setting gear rotatably supported on said first shaft, internal and external gearing formed on said setting gear, a second shaft at least partially supported in a hole formed in said first shaft, a gear being fastened on said second shaft and having teeth meshing with said internal gearing formed on said setting gear, and a gear segment having teeth meshing with the teeth of said cylinder gear to rotate and set said other printing cylinder upon rotation of said setting gear.

4,326,461
TIME DELAY DEVICE

Maxwell H. Toms, Essendon, Australia, assignor to Commonwealth of Australia, Canberra, Australia

Filed Jan. 25, 1980, Ser. No. 115,281
Claims priority, application Australia, Feb. 14, 1979, PD7673
Int. Cl.³ F42C *9/06*
U.S. Cl. 102—277 **8 Claims**

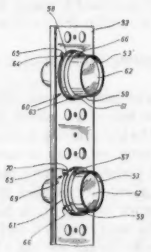


1. A time delay device for, in use, combination with a firing device demolition of the type having a movable member which is movable from a deactivated condition, in which it engages and holds a firing pin in a retracted position, to an activated condition disengaged from said firing pin so as to release said firing pin to detonate an associated explosive element, said time delay device comprising a movable member which is movable from a first condition, in which it engages and holds a piston arrangement in a retracted position, to a second condition disengaged from said piston arrangement to release said piston arrangement, said piston arrangement having an end exposed to, and acting upon, fluid within a chamber, a control piston having one end exposed to fluid pressure in said chamber through a supply port, and a valve means to set the rate of transfer of fluid through said supply port under the influence of the pressure exerted by the release of said piston arrangement, said control piston, in use, cooperating with the movable member of the firing device demolition to hold said movable member in said deactivated condition movable to a position, under the influence of said fluid pressure, at a rate depending on the setting of said valve means, whereby said movable member of said firing device demolition will be free to move to said activated condition to release said firing pin.

4,326,462
SHAPED CHARGE RETENTION AND BARRIER CLIP

Jose B. Garcia, Houston, Tex., and Michel J. Bosse-Platiere, Versailles, France, assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Sep. 21, 1979, Ser. No. 77,575
Int. Cl.³ E21B *43/117*; F42B *1/02*
U.S. Cl. 102—310 **8 Claims**



1. In a perforating gun containing a shaped charge disposed in a carrier strip, the shaped charge having a generally cylindrical cross-sectional configuration and a circumferential raised portion, the carrier strip having a first opening therein which receives the shaped charge and substantially conforms to the cross-sectional configuration of the shaped charge and at least one second opening adjacent said first opening, and the circumferential raised portion of the shaped charge abuts and overlies the carrier strip, the improvement which comprises:

a shaped charge retention and barrier clip which includes:

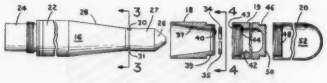
a barrier ring means for preventing damage to the interior of the perforating gun, caused by the shaped charge upon detonation thereof, and adapted for resting upon the circumferential raised portion of the shaped charge; and

retention means for securing said barrier ring means and said shaped charge to said carrier strip, said retention means being integral with said barrier ring means and depends and extends outwardly therefrom, and adapted for overlying the circumferential raised portion of the shaped charge and for passing through the second opening in the carrier strip and engaging the carrier strip to secure the shaped charge and the barrier ring means to the carrier strip.

4,326,463
DYE MARKER ASSEMBLY FOR ROCKET PRACTICE ROUND

Leonard F. Burke, Fallston, and Arthur P. Dean, Glen Arm, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 27, 1980, Ser. No. 153,469
Int. Cl.³ F42B *11/16*
U.S. Cl. 102—513 **1 Claim**



1. A training warhead for a training rocket assembly comprising:

a warhead fuselage including at least one slot formed in a surface of said warhead fuselage, a conical section rearward of said at least one slot, and a cylindrical section forward of said slot;

a nose cone section made of a frangible material and defining a cavity for receiving therein dye marker means, and

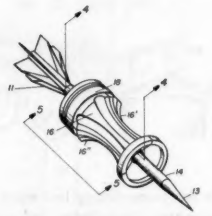
means for securing said nose cone section to said fuselage comprising a first retainer unit and a second retainer unit, said first retainer unit having a tapered bore conforming to the taper of the conical section of said fuselage and said second retainer unit containing a bore conforming to said cylindrical fuselage section forward of said slot, said first and second retainer units being threadedly engaged and cooperating to define an interior annular channel, said annular channel and said at least one slot cooperating to define a cavity within which to receive a split ring, said split ring for precluding relative longitudinal movement between said means for securing said nose cone section to said fuselage,

wherein said fuselage, said nose cone section and said means for securing said nose cone section to said fuselage are all generally cylindrical in configuration and have substantially identical outside diameters.

4,326,464
GUSSET DISCARDING SABOT MUNITION

Renata F. Price, Morris City, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 10, 1979, Ser. No. 102,084
Int. Cl.³ F42B *13/16*
U.S. Cl. 102—523 **4 Claims**



1. A discarding sabot munition which comprises:

a subcaliber fin-stabilized projectile having a pointed front end, a fin-stabilized rear end and a cylindrically shaped central body section, said central body section having a plurality of external circular body threads disposed on a section thereof;

sabot means, operatively disposed circumambient said subcaliber projectile and intermediate said projectile front and rear ends, and interlocked with said body threads of said central body section, for acting as a reduced mass full-caliber carrier for said subcaliber fin-stabilized projectile, for propelling said subcaliber projectile with increased velocity and imparting increased kinetic energy thereto, for preventing inbore balloting of said subcaliber projectile during launch with minimum sabot means mass, and for discarding from said subcaliber projectile after launch, which includes;

a plurality of arcuately shaped sabot segments operatively positioned on said subcaliber projectile; said sabot segments further include;

a sabot segment member arcuately shaped bore rider front end;

a cylindrically shaped sabot body mid-section member integrally coupled to said bore rider front end;

a sabot segment member arcuately shaped rear end coupled to said sabot body mid-section member having an annular obturating ring groove peripherally located therein for fixedly holding said obturating ring;

an obturating ring operatively disposed in said sabot means for preventing propellant gas blow-by around said sabot means during launch and for releasing said sabot means to discard from said subcaliber projectile after lanuch;

gusset plate means for spacially positioning and structurally supporting said sabot bore rider front end with said sabot segment member rear end, for reducing the overall connecting mass requirements of said sabot body midsection member to enable said sabot munition to acquire increased velocity after launch, which includes;

a plurality of radially disposed gusset plates having longitudinal upper concave surfaces and bottom substantially flat surfaces which are parallel to said central body section thereon which includes;

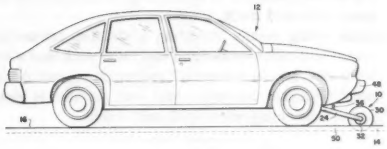
a central beam member having a modified "I" beam cross-sectional configuration, said central beam member operatively disposed intermediate said sabot bore rider end and said sabot rear end; and

a pair of half beam members equally disposed on both sides of said central beam member, each separated therefrom by longitudinally positioned slots which have essentially parallel sides.

4,326,465
AUTOMOBILE TOW WHEEL ATTACHMENT

Sid Forrest, Rte. 2, Box 144, Bartlesville, Okla. 74003

Filed May 27, 1980, Ser. No. 153,329
Int. Cl.³ B61B *9/00, 13/12;* B61C *11/02*
U.S. Cl. 104—165 **4 Claims**



1. In combination with a conventional automobile movable along a highway as a passive vehicle; an externally powered conveyor system having a continuously moving channel disposed beneath the surface of said highway and movable longitudinally beneath said surface; a tow wheel attachment mounted on said automobile and comprising a tubular metal frame having a lower horizontal axle, a pair of legs extending divergently outwardly away from said axle and a horizontally disposed crossbeam interconnecting said legs intermediate their ends, a single wheel freely rotatably mounted on said axle; locking means for preventing rotation of said wheel on said axle; means for pivotally attaching said legs to a lower surface of said automobile; and means pivotally interposed

between said crossbeam and said lower surface of said automobile for lowering and raising said frame whereby, when said automobile is positioned over said conveyor system to straddle said channel, the lowering of said frame brings said wheel into engagement with said channel, and upon locking said wheel causes said automobile to be pulled along said highway as a passive vehicle by the channel.

4,326,466

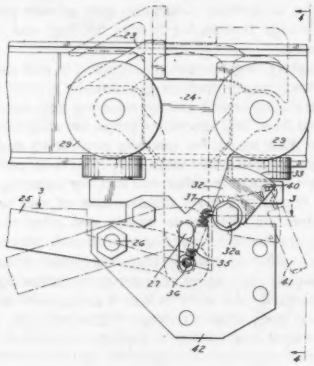
ANTI-BACK UP DEVICE FOR CONVEYOR TROLLEY

James L. Parry, Detroit; Martin J. Redden, Emmett, and Albert Goldstein, Southfield, all of Mich., assignors to ACCO Industries Inc., Bridgeport, Conn.

Filed Mar. 13, 1980, Ser. No. 130,204

Int. Cl.³ B61B *10/02*; B61C *13/06*

U.S. Cl. 104—172 S **14 Claims**



1. A power and free conveyor system comprising

a track,

at least one carrier movable along said track,

a conveyor for driving said carrier along said track,

pusher means on said carrier movable into and out of driving engagement with said conveyor,

operating means comprising a lever pivoted intermediate its ends on said carrier and having one end extending forwardly and the other end extending rearwardly, said lever being operable to move said last mentioned pusher means out of driving engagement with said conveyor upon contact with a preceding carrier or an obstacle,

an anti-back up cam member movably mounted on said carrier and adapted to be moved into and out of engagement with said track,

tension spring means providing a yielding connection between said cam member and said lever such that when said lever operates to move said pusher means out of engagement with said conveyor, said cam member is yieldingly urged into engagement with said track.

4,326,467

PALLET FORMED OF FOLDED PROFILED METAL SHEET

Hermann Schleicher, Erlangen-Rathsberg, and Norbert Vogel, Erlangen, both of Fed. Rep. of Germany, assignors to Hermann Schleicher GmbH & Co., Erlangen, Fed. Rep. of Germany

Filed Mar. 10, 1980, Ser. No. 128,589

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1979, 2909206

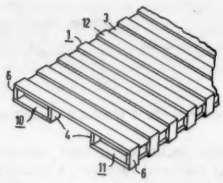
Int. Cl.³ B65D *19/22*

U.S. Cl. 108—51.1 **5 Claims**

1. A pallet providing a loading area carried by box-type girders extending along beneath the opposite borders of the loading area comprising:

a single profiled metal sheet formed to have a transverse cross section defining parallel grooves spaced by surface areas which form the loading area for the pallet,

each of the opposite borders of said profiled sheet having a folded hollow girder formed by said sheet being folded inwardly several times transversely of said grooves, each said girder having an inner supporting wall and an outer supporting wall with three transverse bend lines lying in



the opposite border zones of said sheet disposed at three corners of the girder,

recesses formed in said sheet for each said groove, each said recess being shaped in the general configuration of the groove with one such recess being disposed along each said bend line to accommodate the groove configuration in said folded hollow girder, and

slots cut in said sheet associated with the ends of each said recess to accommodate folding said profiled sheet into said girders.

4,326,468

BLAST SUPPRESSIVE SHIELDING

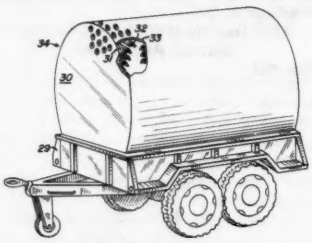
Paul V. King, Joppatowne; Albert F. Becher, Fallston, and Wilmer P. Henderson, Bel Air, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 699,738, Jun. 24, 1976, abandoned, which is a continuation of Ser. No. 495,177, Aug. 6, 1974, abandoned.

This application Sep. 24, 1979, Ser. No. 78,349

Int. Cl.³ F41H *5/04, 5/16, 7/04*

U.S. Cl. 109—49.5 **11 Claims**



1. A vehicle for transporting hazardous materials such as munitions, explosives, propellants and pyrotechnics, which includes a compartment for containing said hazardous materials and wherein at least a portion of the compartment includes a multilayer metal or metal-like composite comprising, in combination:

a first apertured plate in the form of a louvered plate suitable for slowing or confining blast debris and fragments;

a second apertured plate in the form of a perforated plate defining a plurality of gas flow apertures suitable for attenuating blast overpressure; and

means for mounting said first and second apertured plates in

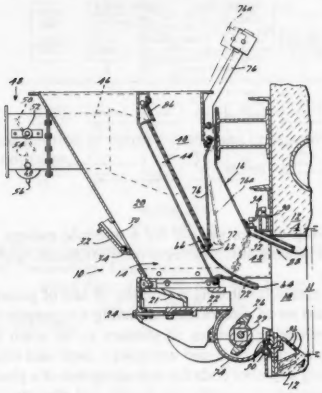
spaced apart and substantially fixed position relative to each other.

4,326,469

MULTI-FUEL FEEDER DISTRIBUTOR

David C. Reschly, Monroe, Mich., assignor to Detroit Stoker Company, Monroe, Mich.

Filed Nov. 2, 1979, Ser. No. 90,560
Int. Cl.³ F23K 3/18
U.S. Cl. 110—115 30 Claims



1. A multi-fuel feeder for a stoker including a furnace, comprising:

a throat through which waste fuel and coal are fed into the furnace of the stoker;

coal feed means including a rotor for throwing coal through said throat into said furnace; and

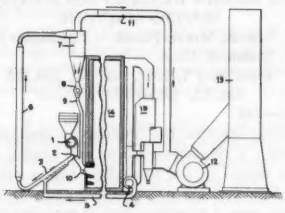
waste feed means for feeding waste fuel through said throat into said furnace along a path in said throat spaced from the path of coal from said rotor, whereby all mixing of said coal and said waste fuel occurs in said furnace.

4,326,470

INDIVIDUAL BAGASSE DRIER

Luiz E. C. Maranhao, Rua Belo Horizonte, 275, Maceio, Al, Brazil

Filed Jul. 18, 1980, Ser. No. 170,981
Claims priority, application Brazil, Jul. 18, 1979, 7904599
Int. Cl.³ F23G 5/02
U.S. Cl. 110—220 6 Claims



1. In combination with a furnace for burning bagasse, wherein the furnace includes a fuel entrance and an exhaust for gasses,

a bagasse heating chamber,

means for feeding bagasse to said chamber,

means for supplying heated gas to said chamber,

a gas-solid separator including an inlet for solid material and gas, an outlet for gas, and an outlet for solid material,

means for conveying heated bagasse and moisture-laden gas from said chamber to the inlet of said gas-solid separator,

means for connecting the solid material outlet of the separator to the fuel entrance of said furnace,

gas impelling means having an inlet,

means for connecting the inlet of the impelling means to the furnace exhaust for gases,

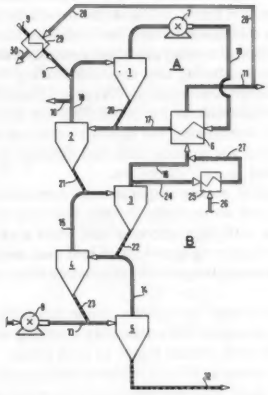
means for connecting the inlet of the gas impelling means to the outlet for gas of said separator, and said bagasse feeding means comprising a feeder located above the fuel entrance of said furnace, a conduit extending from the feeder and having branches to the fuel entrance and to the chamber, and a baffle plate blocking the branch to the fuel entrance.

4,326,471

PROCESS FOR THE CARBONIZATION OF OIL SHALE AND OTHER CARBONIZABLE MATERIALS

Gerhard Rohrbach, and Bernd Hollman, both of Dotternhausen, Fed. Rep. of Germany, assignors to Portlandzementwerk Dotternhausen Rudolf Rohrbach Kommanditgellschaft, Dotterhausen, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 168,058
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1979, 2929786
Int. Cl.³ F22B 7/00
U.S. Cl. 110—341 7 Claims

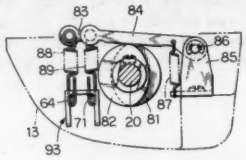


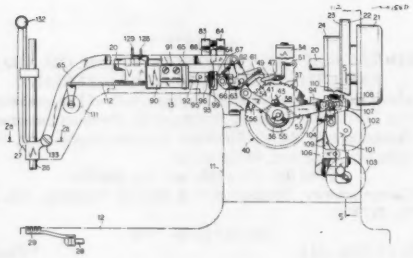
1. In a process for the carbonization of oil shale or other carbonizable materials including a process line with a closed cycle and without condensate recovery wherein materials flowing through said process line are heated to carbonization temperature through heat exchange, the improvement comprising: said closed cycle being a gas cycle; combusting fuel remaining in the carbonized residue, particularly carbon, in an open-cycle second process line; conveying the heat recovered in the exhaust gas of said combustion through heat exchange to said first process line whereby the combustion air is subjected to a heat exchange with the ash of the combustion step in said second process line.

4,326,472
NEEDLE OSCILLATING MECHANISM FOR A SEWING MACHINE

Chikao Yamashita; Takao Sugaya, and Noriyuki Yoshida, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jan. 23, 1979, Ser. No. 5,828
Claims priority, application Japan, Feb. 10, 1978, 53-14441; Apr. 25, 1978, 53-49132
Int. Cl.³ D05B 3/02
U.S. Cl. 112—158 D 8 Claims





1. In a sewing machine having a machine frame, a main shaft journaled on said frame, and a needle driven by said main shaft for endwise reciprocation and for lateral oscillation,

mechanism in said sewing machine responsive to pattern information for oscillating said needle including

a single pattern cam member carrying a plurality of pieces of pattern information for controlling the lateral oscillation and for determining the lateral position of said needle,

a step motor for rotating said cam member in either of forward and reverse directions,

drive control means responsive to control signals applied thereto for sequentially driving said step motor in timed relation with the rotation of said main shaft,

a contact finger engageable with said cam member for selectively sensing the pattern information from said cam member,

a connection arm operatively connected with said needle,

coupling means for disconnectably coupling said connection arm and said contact finger to each other,

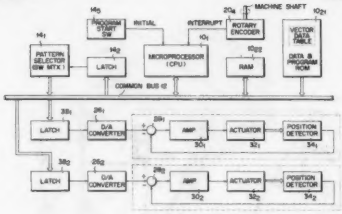
actuating means operative in timed relation with the rotation of said main shaft for alternately engaging and disengaging said contact finger with and from said cam member through said coupling means,

brake means for applying a motional resistance to said connection arm and for preventing the same from being displaced upon disengaging of said contact finger from said cam member through the disconnecting operation of said coupling means, whereby said needle is relieved of lateral oscillation regardless of disengaging motion of said contact finger from said cam member, and thereafter only upon engaging of said contact finger with said cam member the needle is oscillated to the lateral position in response to said pattern information.

4,326,473
SEWING CONTROL SYSTEM FOR MULTIPLE-PATTERN SEWING MACHINE

Teruo Kigawa, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation of Ser. No. 908,649, May 23, 1978, abandoned. This application Nov. 14, 1979, Ser. No. 94,342
Claims priority, application Japan, May 23, 1977, 52-59688
Int. Cl.³ D05B 3/02
U.S. Cl. 112—158 E 62 Claims



1. A sewing control system for a multiple pattern sewing machine for sewing stitch patterns on workpieces, said system comprising:

memory means for storing a plurality of sets of pattern data, each said set of pattern data including a sequence of stitch data indicating a series of stitches to be sewn by said sewing machine on a said workpiece, each said stitch data including a symbol code for indicating one of a plurality of basic vectors to specify the length and direction of said stitch in polar coordinates;

means for designating a desired set among said plurality of sets of pattern data;

data processor means coupled with said memory means and said designating means for generating sewing control signals corresponding to said set of pattern data designated by said designating means;

actuator means coupled with said data processor means for performing sewing operations in response to said sewing control signals in order to form on a said workpiece a stitch pattern corresponding to said designated set of pattern data; and

timing signal generator means coupled with said data processor means and said actuator means for supplying timing signals to synchronize said sewing control signals generated by said data processor means with said sewing operations performed by said actuator means.

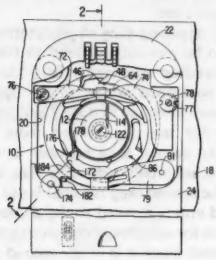
4,326,474
IN-PLACE BOBBIN WINDING MECHANISM FOR A SEWING MACHINE

Thaddeus J. Zylbert, Morris Plains, N.J., assignor to The Singer Company, Stamford, Conn.

Filed May 1, 1981, Ser. No. 259,718
Int. Cl.³ D05B 57/14, 59/00
U.S. Cl. 112—184 10 Claims

1. In a sewing machine, the combination comprising a reciprocable needle, a rotatable vertical axis needle looptaker, a bobbin case nested in the looptaker, means preventing the bobbin case from rotating, a bobbin disposed within and resting on the bobbin case, a plunger which is mounted in the bobbin for endwise sliding movement along the axis of the bobbin and upon which the bobbin is rotationally restrained, means biasing the plunger into a raised position in the bobbin, a slidable plate with a cam thereon for engaging and moving the plunger from said raised position to a depressed position in the plunger, means for operably connecting the plunger to the looptaker in the depressed position in the plunger to provide for rotation of

the bobbin with the looptaker, and for disconnecting the plunger from the looptaker upon movement of the plunger to



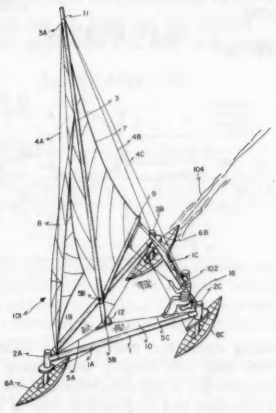
the raised position to thereby enable the bobbin to rotate free of the looptaker.

4,326,475

SAILBOAT

Frank J. Berte, Suffield, Conn., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 16, 1979, Ser. No. 20,905
Int. Cl.³ B63B *35/00*
U.S. Cl. 114—39 **20 Claims**



1. A sailboat adapted to sail on water in a sailing direction that comprises, in combination:

three rigid beams that form the sides of a triangle having a generally horizontal orientation,

an integral, rigid mast that extends between top and foot ends and disposed substantially orthogonal to the plane of the triangle, the foot end of the mast being disposed within the perimeter of the triangle and piercing the plane of the triangle,

a plurality of cables extending from each vertex of said triangle to said top and foot ends of said mast, the ones of said cables extending to the foot of said mast lying below the plane of said triangle, said cables being stretched to support the mast in said orthogonal orientation as well as to render a space frame defined by said beams, mast and cables rigid;

three hulls positioned respectively at the three vertices of the triangle, and

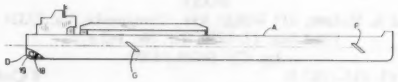
means for mounting said hulls to said vertices so that they each are rotatable about both a first axis generally parallel to the plane of said triangle and generally perpendicular to the sailing direction and a second axis raked backwardly from the sailing direction and from a normal to said triangle by an angle α.

4,326,476

NAVIGATION IN ICE COVERED WATERWAYS

Charles D. Pole, Willowdale, Canada, assignor to Upper Lakes Shipping Ltd., Toronto, Canada

Filed Dec. 17, 1979, Ser. No. 104,699
Int. Cl.³ B63B *35/08*
U.S. Cl. 114—40 **17 Claims**



1. A ship having a hull of length from about 600 to about 1000 feet provided with straight substantially vertical elongated sides tapering inwards, at one end, into a pointed bow normally adapted, with the forward motion of the ship against an ice covering of a waterway, to break a channel in said covering equivalent to the normal width of the ship to allow the ship to move forward,

a bulky icebreaking fin mounted to project outwards from each straight side just behind the bow with a fixed continuous deflecting surface extending from below to above the waterline at a sternward angle of from 10° to 60° from a line perpendicular thereto and along its length a sternward incline thereby, with the advance of the ship to apply forward, upward and outward pressure on the ice beside the main channel to break an auxiliary channel thereby to provide leeway for the ship to move forward through the ice and to execute turns,

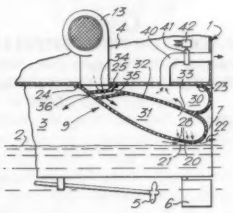
the fin having a fore to aft width from about 2 feet to about 3 feet and an effective thickness measured out from the ship's side of from about 1 foot to about 4 feet.

4,326,477

GAS-CUSHION VEHICLES

Rory A. C. Carter, Cowes, England, assignor to Vosper Hovermarine Limited, England

Filed Jun. 10, 1980, Ser. No. 158,100
Claims priority, application United Kingdom, Jun. 18, 1979, 20486/79
Int. Cl.³ B60V *1/16*
U.S. Cl. 114—67 A **14 Claims**



1. A gas-cushion vehicle provided with a flexible skirt of hollow inflatable form, which, in operation of the vehicle, depends from the vehicle body so that the bottom of the skirt defines a convex face in close proximity to the surface over which the vehicle is to travel so as to form a plenum gap through which an atmosphere-seeking flow of cushion gas escapes, the vehicle comprising:

a flexible two-stage skirt, having an upper compartment and a lower compartment;

means for inflating the upper and lower compartments, the

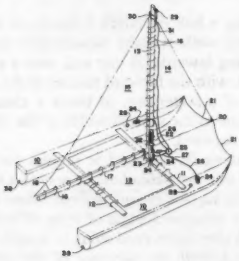
lower compartment being inflated to a higher operating pressure than that existing in the upper compartment and the upper compartment being inflated to a higher operating pressure than that existing in the gas cushion, whereby the lower compartment remains relatively stiff, reducing distortion of the skirt due to contact with the travel surface and the upper compartment remains relatively soft ensuring a substantial measure of overall skirt flexibility.

4,326,478

WATER-REMOVING SYSTEM FOR A CATAMARAN BOAT

David A. Holmes, 811 Wright Ave., Chesapeake, Va. 23324

Filed Jun. 27, 1980, Ser. No. 163,670
Int. Cl.³ B63B *13/00*
U.S. Cl. 114—183 R **6 Claims**



1. An improved system for removing water from the hollow interiors of the hulls and mast of a catamaran boat comprising:

a. a manually operable pneumatic pump releasibly attached to said boat,

b. three flexible conduits, the proximal ends of which receive air from said pump, the distal ends of which are provided with disconnectable couplings, two of said distal ends communicating with the interiors of said hulls, and one of said distal ends communicating with the interior of said mast, and

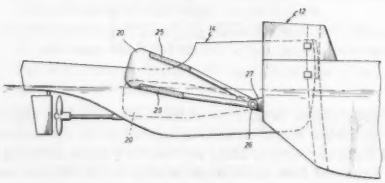
c. ejector means equipped with check valve means positioned in each of said hulls and said mast, whereby activation of said pump generates a pneumatic pressure which may be directed to the interiors of said hulls and mast to cause water therein to be driven out through said ejector means.

4,326,479

MOVABLE SKEG FOR NON-PROPELLED BARGES

Masasuke Kawasaki, 1002 Michigan Ave., Slidell, La. 70458

Filed Apr. 17, 1980, Ser. No. 140,963
Int. Cl.³ B63B *21/00*
U.S. Cl. 114—248 **23 Claims**



11. An apparatus for coupling first and second vessels, comprising:

(a) a first skeg of predetermined configuration adapted to be movably secured to the stern of the first vessel, extending rearwardly from the first vessel, such that the first skeg may be moved from a first position, wherein the first skeg is in the water sufficiently to substantially reduce yawing, to a second position wherein the first skeg member is out of the water ; and

(b) a second, opposing skeg of predetermined configuration adapted to be movably secured to the stern of the first vessel, extending rearwardly from the first vessel, such that it is positioned in use on the opposing side of the second vessel from the first skeg and such that the second skeg member may be moved from a third position, wherein the second skeg member is in the water sufficiently to substantially reduce yawing, to a fourth position wherein the second skeg member is out of the water when the second arm is secured to the second vessel;

(c) first means for selectively connecting the first skeg to the second vessel when it is in the second position; and

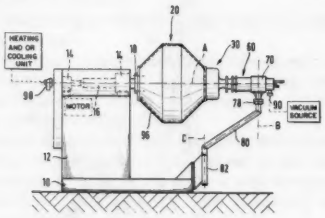
(d) second means for selectively connecting the first skeg to the second vessel when it is in the fourth position.

4,326,480

ROTATABLE COATING VESSEL

Werner Glatt, Kreis Lörrach, Fed. Rep. of Germany, assignor to Werner Glatt GmbH, Binzen, Fed. Rep. of Germany

Filed Sep. 19, 1980, Ser. No. 188,700
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1979, 2938795
Int. Cl.³ B05B *1/02*
U.S. Cl. 118—50 **8 Claims**



7. A coating apparatus, comprising a coating vessel supported at one end, said coating vessel being adapted to be driven in rotation and being connected to a vacuum source by a coaxially arranged and co-rotatable tube at an unsupported end of the coating vessel, said coating vessel having a spray nozzle for spraying liquid into said coating vessel, said coating vessel including a discharge opening which is closable by a cover at the unsupported end of the coating vessel.

4,326,481

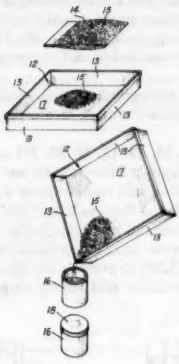
URINE COLLECTION PROCEDURE FOR CATS AND APPARATUS THEREFOR

John E. Gruss, Burke, Va.

Filed Nov. 3, 1980, Ser. No. 203,482
Int. Cl.³ A01K *29/00*
U.S. Cl. 119—1 **16 Claims**

1. A urine collection system for cats and members of the cat family comprising a granular, non-absorbent, non-porous, hydrophobic litter which is capable of being spread in a pan, said litter having substantially cylindrical particles with a diameter between about 1 millimeter up to about 5 millimeters and a height between about 1 millimeter up to about 5 millime-

ters and being substantially smooth whereby the cat can urinate in the pan to permit easy removal of a urine sample at a



minimum loss without the need to manually express the urine or catheterize the cat.

4,326,482

FEEDING APPARATUS FOR SMALL ANIMALS

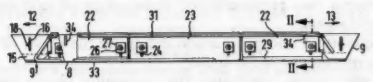
Walter Sauer, Am Dreispitz 33, D-8750 Aschaffenburg, Fed. Rep. of Germany

Filed Jun. 12, 1980, Ser. No. 158,841

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1979, 2923921

Int. Cl.³ A01K *39/01*

U.S. Cl. 119—52 B **8 Claims**



1. In a feeding apparatus used in conjunction with at least one cage, the apparatus having a feed channel with upstanding walls extending adjacent the cage, a fill nozzle protruding into the channel and movable along the length of the channel, the improvement comprising:

a metering sled positioned in the channel and slidably movable along the length thereof and drivingly contactable by the fill nozzle, the metering sled having plowing means moving in advance of the fill nozzle and wherein the plowing means is adjustable in height and is angled to direct plowed feed toward a preselected upstanding wall; and

guide means mounted to the plowing means and extending generally longitudinally along the channel for retaining new feed along a longitudinal zone in the channel, remote from the upstanding wall of the channel.

4,326,483

INTERNAL COMBUSTION ENGINE WITH OXIDANT MANUFACTURE

Frank E. Lowther, Buffalo, N.Y., assignor to Purification Sciences, Inc., Geneva, N.Y.

Filed Apr. 16, 1980, Ser. No. 140,765

Int. Cl.³ F02B *43/08*

U.S. Cl. 123—3 **3 Claims**

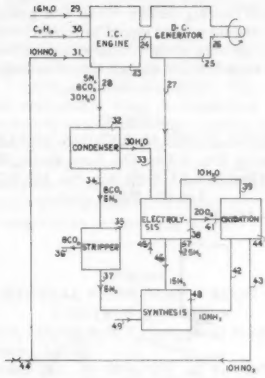
1. An internal combustion engine system including:

(a) an internal combustion engine in which fuel is combusted with concentrated oxidant to generate power and a mixture of combustion products including nitrogen, carbon dioxide, and water vapor,

(b) means to remove water from said combustion products,

(c) means to remove carbon dioxide from said combustion products,

(d) electrolysis means to decompose said water to produce hydrogen and oxygen,



(e) synthesis means to combine nitrogen from said combustion products with said hydrogen to produce ammonia,

(f) oxidation means to combine said ammonia with said oxygen to produce nitric acid, and

(g) means to return said nitric acid to said engine for repeated use as oxidant to support combustion.

4,326,484

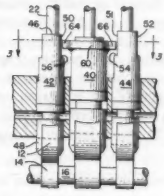
FLOATING TAPPET GUIDE PLATE

Earl F. Amrhein, Greensburg, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Oct. 26, 1979, Ser. No. 88,561

Int. Cl.³ F01L *1/14*

U.S. Cl. 123—90.5 **15 Claims**



8. An internal combustion engine comprising:

(a) a rotatable camshaft;

(b) first and second tappets mounted for engagement with said camshaft to convert rotational movement of the camshaft into reciprocating linear movement of said tappets along a pair of parallel paths aligned with the central longitudinal axes of the tappets, respectively, the body of said first tappet including a guide surface defined by a set of lines parallel to the longitudinal axis of said first tappet; and

(c) guide means for preventing rotation of each said tappet about its longitudinal axis, said guide means including:

(1) an extension leg having a length substantially corresponding to the distance between said tappets,

(2) attachment means for securing fixedly and integrally one end of said extension leg to said second tappet for causing said extension leg to move with said second tappet in a fixed position relative to said second tappet and extending toward said guide surface of said first tappet,

and

(3) bearing surface means on the other end of said extension leg for forming a sliding engagement with said guide surface of said first tappet, said bearing surface means including a bearing surface located on said other end of said extension leg in a position to provide a nominal working clearance between said guide surface and said bearing surface when said guide means is secured on said second tappet to cause direct engagement of said bearing surface with said guide surface should either tappet rotate slightly about its longitudinal axis.

4,326,485

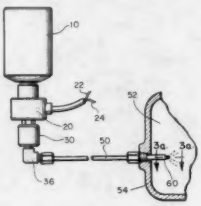
STARTING FLUID INJECTION APPARATUS

James W. Burke, Rte. 2, Box 476, Long Grove, Ill. 60047

Filed Feb. 21, 1980, Ser. No. 123,462

Int. Cl.³ F02M *1/16*

U.S. Cl. 123—180 AC **21 Claims**



1. In a starting fluid injection apparatus for an internal combustion engine, said apparatus including an actuator for selectively releasing a starting fluid from a container, injector means for injecting starting fluid into an air intake passage of the engine, and a conduit for interconnecting the actuator and the injector means, the improvement comprising:

flow metering orifice means, included in the injection apparatus, for metering the flow rate of starting fluid from the actuator to the injector means; and

an injection orifice included in the injector means in series with the flow metering orifice means such that starting fluid passes through the orifice means and then through the injection orifice as it passes from the container, through the conduit, and out the injector means, wherein the flow metering orifice means is sized such that the pressure drop across the injection orifice is substantially no greater than the pressure drop across the flow metering orifice means during injection of starting fluid into the engine.

4,326,486

APPARATUS FOR GENERATING AN IGNITION CONTROL SIGNAL FOR AN INTERNAL COMBUSTION ENGINE

Manfred Mezger, Markgröningen; Reinhard Leussink, Vaihingen, and Adolf Fritz, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 4, 1979, Ser. No. 81,622

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845284

Int. Cl.³ F02P *5/08*

U.S. Cl. 123—418 **5 Claims**

1. Apparatus for generating an ignition control signal having

a rotating engine speed transducer assembly (**10**) for supplying a pulse-type engine speed signal of substantially constant angular duration, and having two edges;

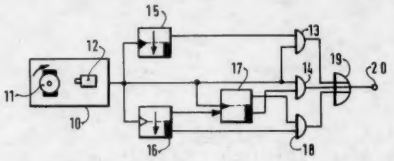
and circuit means for shifting the time of occurrence of one of the pulse edges of said engine speed signal, which controls ignition, in the direction of spark advance with decreasing engine speed, within two discrete engine speed limits (n_1, n_2) both of which lie substantially within the range of engine idling, and which define therebetween a lower speed (n_1) and an upper speed (n_2) of said range

and wherein, according to the invention, said circuit means for shifting the engine speed signal comprises

first and second timing means (**15, 16; 30, 31**) each having a triggering input connected to said engine speed transducer assembly (**10**);

a flip-flop (**17, 36**) connected to and receiving an output signal from said second timing means (**16, 31**) as an input signal;

and gate means (**13, 14, 18, 19, 33, 34, 37**) connected to and receiving output signals from at least one of said first and second timing means, said engine speed transducer assembly and from said flip-flop, said first and second timing means, being connected, respectively, to be triggered by respectively different succeeding pulse edges of the engine speed signal (**U10**) to provide timing output signals of respective time duration, said timing output signals being



connected to said gate means to compare the duration of said timing output signals of the second timing means with the time duration between two sequential unlike first pulse edges of said engine speed signal, the equality of said comparison indicating the lower of said discrete engine speed limits, and to compare the duration of the output signal of said first timing means with the time duration between two predetermined pulse edges of said engine speed signal,

the equality of said comparison indicating the upper of said discrete engine speed limits;

said gate means combining the respective timing output signals of said first and second timing means, and said engine speed signal to that the pulse edges of the output signals produced by one of the timing means at the termination of its timing output signals form a time shifted pulse edges of the engine speed signal upon occurrence of nonequality of said comparison between said discrete engine speed limits for controlling ignition.

4,326,487

FUEL INJECTION SYSTEM

Wolfgang Maisch, Schwieberdingen; Klaus-Jürgen Peters, Affalterbach; Michael Wissmann, Gerlingen, and Peter Schelhas, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 20, 1980, Ser. No. 132,056

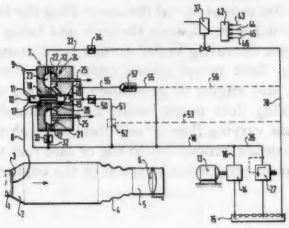
Claims priority, application Fed. Rep. of Germany, May 8, 1979, 2918401

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—453 **1 Claim**

1. In a fuel injection system for mixture compressing externally ignited internal combustion engines comprising an air suction tube, a measuring member and an arbitrarily actuatable butterfly valve movably disposed in said suction tube with said measuring member upstream from said butterfly valve, a fuel metering and distribution valve, a fuel supply line connected to said fuel metering and distribution valve, a movable fuel metering control slide in said metering and distribution valve, a control lever secured to said measuring member and operative relative to said control slide which is subjected to a restoring pressure force for exerting a resetting force on said measuring member, said measuring member being mounted for movement

by flowing air depending on an air flow rate through said suction tube and in opposition to a resetting force of said control slide wherein the flowing air displaces said measuring member which displaces said control slide for the purpose of metering out a fuel quantity in proportion to the air quantity, the control slide metering taking place normally while substantially a constant pressure difference prevails, said pressure being variable in accordance with operational characteristics of said engine, said metering and distribution valve including a



pressure chamber therein relating to said control slide, said control slide including an end face that protrudes into said pressure chamber, a fuel feed line connected to said pressure chamber for applying a resetting force on said control slide, a damping throttle in said fuel feed line, a fuel discharge line connected to said fuel feed line between said damping throttle and said pressure chamber, and a check valve disposed in said discharge line between said pressure chamber and the delivery side of a fuel pump opens above a predetermined pressure in the pressure chamber.

4,326,488

SYSTEM FOR INCREASING THE FUEL FEED IN INTERNAL COMBUSTION ENGINES DURING ACCELERATION

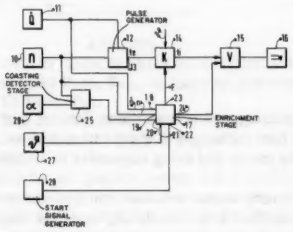
Harro Herth, Schwieberdingen, Fed. Rep. of Germany; Cornelius Peter, Paris, France, and Hans Schnürle, Walheim, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 9, 1979, Ser. No. 65,232

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 2841268

Int. Cl.³ F02D 5/00

U.S. Cl. 123—492 **21 Claims**



1. A system for increasing the fuel feed during acceleration, in an internal combustion engine having a throttle valve and an injection valve, pulse signal generating means connected to generate a pulse signal to the injection valve, the system including:

a coasting detector stage connected to the throttle valve and the engine which generates a signal indicating vehicle coasting, as a function of throttle valve angle and engine rpm;

a means which generates a time constant according to engine rpm;

means for detecting acceleration including an enrichment stage having a differential member and proportional member, wherein the differential member is connected to the means which generates a time constant to receive a time constant and to generate a differential output depending on the time constant, and

wherein the proportional member is connected to the differential member to receive the differential output and to generate a signal proportional thereto, and

wherein the enrichment stage is connected to the pulse signal generating means and to the coasting detector stage to receive the signal indicating vehicle coasting,

such that the pulse signal generating means generates a lengthened pulse signal which is received by the injection valve to provide prolonged fuel injection by the injection valve in response to the coasting signal.

4,326,489

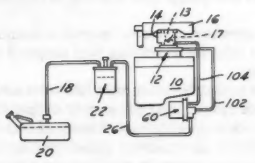
PROPORTIONAL FLOW FUEL VAPOR PURGE CONTROL DEVICE

John S. Heitert, Ringwood, N.J., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1979, Ser. No. 107,991

Int. Cl.³ F02M 33/02

U.S. Cl. 123—520 **2 Claims**



1. A fuel vapor purge control device for use with an automotive type internal combustion engine having a carburetor with an induction passage controlled by a movable throttle valve and a fuel float bowl, a fuel tank, a fuel vapor storage canister having a purge air inlet and a vapor inlet and a purge outlet, and passage means connecting the vapors from the fuel tank to the canister for flow into the storage therein during engine shutdown, and vapor purge passage means connecting the outlet to the induction passage for purging the vapors from the canister into the carburetor during engine operation in response to opening of the throttle valve, the carburetor having

a manifold vacuum port in the induction passage at a location below the throttle valve to be subject to changing manifold vacuum levels as the throttle valve moves open, the purge device comprising

a variable area flow control means in the purge passage means variably movable in response to the changing port vacuum levels upon opening of the throttle valve to provide a purge flow of vapors that varies in proportion to the flow of air through the induction passage,

the control means including a conically shaped metering slot in the purge passage means, a valve member movable across the slot to selectively and progressively block and unblock the slot opening to control the mass flow of vapors through the slot, and

vacuum responsive servo means connected to the pressure port and to the valve member to vary the position of the valve member and the opening area of the slot in inverse proportion to the manifold vacuum level,

the servo means including piston means operable in response to the level of manifold vacuum during a closed throttle condition to close the valve member, the manifold vacuum progressively decaying upon opening of the throttle

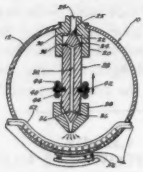
valve to progressively move the piston means and valve member towards a further open position.

4,326,490

FUEL PREHEATER FOR INTERNAL COMBUSTION ENGINES

Ewald Ehresmann, Manly, Iowa, assignor to Combustion Research, Inc., Bloomfield, N. Mex.

Filed Nov. 30, 1979, Ser. No. 98,997
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **10 Claims**



1. In the fuel system of an internal combustion engine including a fuel pump for supplying fuel to a carburetor and a fuel heater imposed in the fuel line, said fuel heater comprising:

(a) a hollow housing having a fuel inlet in communication with said fuel pump, said housing having upper and lower ends,

(b) a fuel atomizer means in operative communication with said fuel inlet for atomizing fuel supplied thereto by said fuel pump,

(c) a valve means between said fuel inlet and said atomizer means for interrupting the supply of fuel to said atomizer means upon a predetermined level of fuel in said housing being present at the lower end of said housing,

(d) a fuel heating means in said housing below said atomizer means for heating the atomized fuel,

(e) said housing having an air inlet for permitting ambient air to enter said housing for mixture with said heated and atomized fuel,

(f) said housing having a fuel discharge in operative communication with said carburetor for supplying the heated and atomized fuel to said carburetor,

(g) float means mounted in the lower end of said housing and connected to said valve means for closing said valve means when said predetermined level of fuel in said housing is present,

said fuel inlet being mounted in the upper end of said housing and having an open lower end, said fuel inlet having a valve seat formed therein above its open lower end, said valve means comprising a valve member vertically movably mounted in said open lower end of said fuel inlet and having an upper end capable of seating upon said valve seat to close said fuel inlet, said valve member having a fuel passageway formed therein extending from a location below said upper end to its lower end; said atomizer means being mounted on the lower end of said valve member; said float means being operatively connected to said valve member for moving said valve member to its seating position on said valve seat.

4,326,491

FUEL HEATER

Lawrence R. Burchett, 10330 Manor Rd., Leawood, Kans. 66206

Filed Jan. 25, 1980, Ser. No. 115,198
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **7 Claims**

1. A fuel heating system in combination with an internal combustion engine utilizing the fuel for powering a motorized vehicle; said vehicle including a cooling mechanism wherein cooling fluid is recirculated through the engine and a fuel pump means for pumping the fuel from storage to the engine; said fuel heating system comprising:

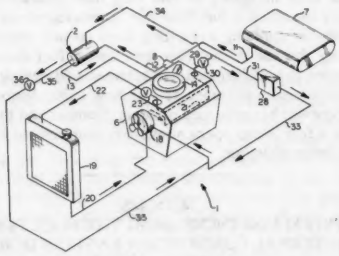
(a) a heat exchanger having said fuel flowing therethrough and said fuel receiving heat therein;

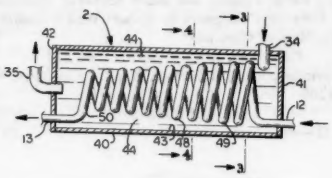
(b) said heat exchanger being flow connected with a flow path of said fuel between said pump means and said engine;

(c) said heat exchanger also having said fluid flowing therethrough after being heated by said engine; said fluid and said fuel being separated so as not to mix;

(d) engine thermostat means for controlling the temperature of said fluid after flowing through and being heated by said engine operating under normal conditions;

(e) cooling fluid pump means controlling flow of fluid through said engine in association with said thermostat; said cooling fluid pump means under normal operating conditions varying flow of said fluid through said engine in approximate proportion to use of said fuel which is in approximate proportion to speed of the engine;





(f) regulating means controlling flow of said fluid through said heat exchanger in cooperation with said cooling fluid pump means and being responsive to ambient air temperature;

(g) whereby under constant ambient air temperature said heated fluid at a substantially constant temperature flows into said heat exchanger in approximate proportion to said fuel and thereby heats said fuel to a relatively constant temperature and flow of said heated fluid increases as ambient air temperature decreases and decreases as ambient air temperature increases thereby maintaining a relatively constant temperature in said fuel prior to entry thereof into said engine, wherein:

(h) said heat exchanger is a concurrent shell and tube type with said fuel flowing through said tube and said fluid flowing through said shell about said tube; and

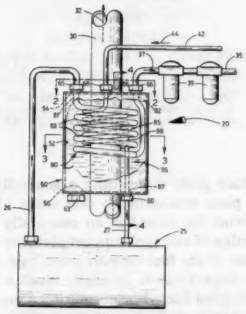
(i) said tube comprises a frusto-conical shaped helix.

4,326,492

METHOD AND APPARATUS FOR PREHEATING FUEL

John G. Leibrand, Sr., and Marlin L. Bessey, both of Idaho Falls, Id., assignors to Runfree Enterprise, Inc., Ucon, Id.

Filed Apr. 7, 1980, Ser. No. 137,723
Int. Cl.³ F02M 31/00
U.S. Cl. 123—557 3 Claims



1. In combination with an internal combustion engine having a substantially cylindrical exhaust pipe of heat-conductive material through which heated exhaust is discharged and a fuel supply, said engine being characterized by return to the fuel supply of excess fuel supplied thereto:

A. a canister having a substantially cylindrical wall mounted substantially concentrically on the exhaust pipe;

B. a fuel line of heat-conductive material having one end connected to the fuel supply, an opposite end connected to the internal combustion engine, and an intermediate portion within the canister helically wound about the exhaust pipe in radially spaced relation thereto;

C. a fuel return line having one end connected to the engine adapted to receive fuel returned thereby, an opposite end connected to the tank and an intermediate portion within the canister helically wound about the exhaust pipe, the intermediate portions of the fuel line and the return line being in outwardly spaced relation to the exhaust pipe and in radially inwardly spaced relation to the wall of the canister; and

D. a heat transfer fluid in the canister having the intermediate portion of the fuel line and of the return line immersed therein and constituting substantially the sole conductor of heat from the exhaust pipe to the fuel line and the return line in the canister.

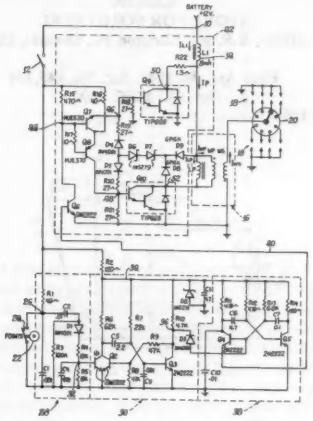
4,326,493

MULTIPLE SPARK DISCHARGE IGNITION SYSTEM

James W. Merrick, El Paso, Tex., assignor to Autotronic Controls, Corp., El Paso, Tex.

Filed Jul. 26, 1979, Ser. No. 60,902
Int. Cl.³ F02P 3/04
U.S. Cl. 123—606 10 Claims

1. In apparatus for an ignition system for a cyclic internal combustion engine, which system has a d.c. power supply and an ignition coil for developing high voltage for distribution to spark plugs to produce sparks across spark gaps in respective combustion chambers at appropriate times in their respective cycles to ignite the fuel contained therein, said appropriate times being separated by quiescent periods, said ignition coil having a primary winding for receiving current from said d.c. power supply and a secondary winding for connection to said spark plugs, the improvement comprising inductor means for receiving current from said d.c. power supply, switching means for directing current passing through said inductor means from said d.c. power supply alternately into two paths, one path through said primary winding of said ignition coil and the other path in shunt of said primary winding, means for maintaining the current through said inductor means of predetermined magnitude at least during the time intervals said switching means directs the current through said other path just prior to the operation of said switching means to direct said current through said one path, cyclic means for cyclically operating said switching means when enabled, enabling means for enabling said cyclic means for substantially a predetermined fraction of each engine cycle, and timing means for timing the onset of each said predetermined fraction relative to



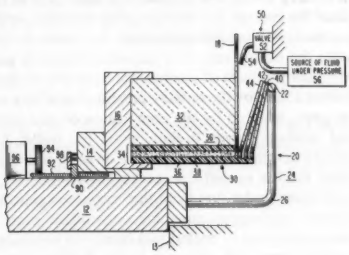
the engine cycle, said switching means directing said current through said other path during the quiescent periods between respective predetermined fractions, with the first spark following a quiescent period being effected upon the subsequent operation of said switching means to direct said current through said one path, and with the first half cycle of said cyclic means in said predetermined fraction being longer than succeeding half cycles and operating to produce a spark discharge in a respective spark gap during said first half cycle.

4,326,494

WAFER AND BOULE PROTECTION DURING THE BLADE RETURN STROKE OF A WAFER SAW

Robert R. Demers, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 973,458, Dec. 26, 1978, Pat. No. 4,227,348.
This application May 27, 1980, Ser. No. 153,632
Int. Cl.³ B28D 1/02
U.S. Cl. 125—12 6 Claims



1. An apparatus for slicing wafers from an ingot comprising a boule of material to be sliced and binding material, said apparatus comprising a saw blade and an ingot chuck in which said ingot is carried, said saw blade having a rest position clear

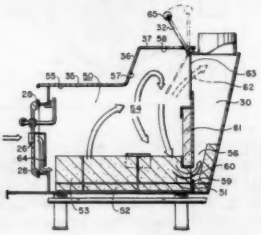
of said ingot, and means for moving said ingot chuck toward said at rest position of said saw blade to slice a wafer from said ingot without completely slicing through said binding material; the improvement comprising: means for directing a flow of fluid toward the interface between said saw blade and a wafer just sliced from said ingot to cause said just sliced wafer to lean away from said saw blade.

4,326,495

STOVE FOR SOLID FUEL

John D. Millar, R.R. #1, Carleton Pl., Ontario, Canada (K7G 3P1)

Filed Apr. 30, 1980, Ser. No. 145,224
Int. Cl.³ F24C *1/00*
U.S. Cl. 126—77 **4 Claims**



1. An air-tight stove for the combustion of solid fuels comprising a chamber defined by a metal casing, said chamber including a floor, a pair of end walls, a back wall, a front wall, means for feeding of solid fuel thereinto, a ceiling and means to permit controlled admission of oxygen-containing gas, said stove further containing a compound combustion chamber comprising:

(a) a primary lower firebox zone on said floor thereof, for the burning of the solid fuel therein;

(b) a secondary upper combustion zone disposed between said primary lower firebox zone and said ceiling, and communicating in an unhindered fashion with said primary lower firebox zone and being fed with a gaseous mixture of partial and complete products of combustion from said primary lower firebox zone, for the secondary combustion of any combustible gases released by the combustion of said solid fuel in said primary lower firebox zone;

(c) an upstanding dorsal flue gas exit chamber contiguous with said back wall;

(d) a tertiary lower rear combustion zone only at the lower proof the base of said flue gas exit chamber, said tertiary combustion zone being encased by firebrick lining and being fed exclusively by a gaseous mixture of partial and complete products of combustion from said primary lower firebox zone, for the tertiary combustion of any combustible gases released by the combustion of said solid fuel in said primary lower firebox zone, the outlet from said tertiary combustion zone leading directly and in an unhindered fashion to said flue gas exit chamber;

(e) a primary outlet flue from the rear lower portion of said tertiary combustion zone for unhindered access of said gaseous mixture of partial and complete products of combustion from said primary lower firebox zone to said tertiary combustion zone; and

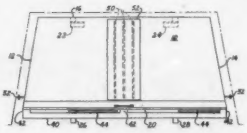
(f) a secondary outlet flue from the rear upper portion of said secondary combustion zone to said flue gas exit chamber, said secondary outlet including a damper therein, operable selectively to discharge gases from said primary combustion zone to said flue gas exit chamber.

4,326,496

FIREPLACE GRATE

George A. Bentrem, R.D. #2 - Box 154, McDonald, Pa. 15057

Filed Jun. 9, 1980, Ser. No. 158,041
Int. Cl.³ F23H *13/00*
U.S. Cl. 126—164 **5 Claims**



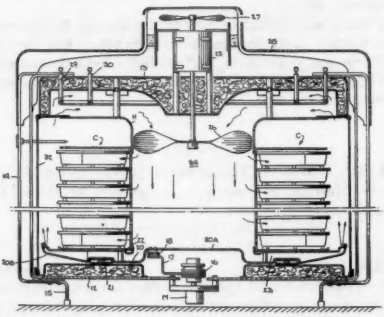
1. A fireplace grate comprising a generally air-impervious fuel-support plate extending to side walls of a fireplace, an upstanding front rim joined in an essentially airtight manner with a front edge of said fuel-support plate for retaining fuel on the top surface of the fuel-support plate, said upstanding front rim being air-impervious to normally block a flow of air from the fuel combustion site while permitting a supply of air to pass into the fireplace over the top of the front rim to aid combustion over the top surface of the fire for burning smoke, said upstanding front rim having at least one air passageway at a lateral side thereof to supply air from the front toward the fuel-burning site on said fuel-support plate, draft control means supported by said upstanding front rim to control the flow of air in said passageway below the top of the front rim to the burning site of fuel on said fuel-support plate, and leg means extending to the hearth of a fireplace for maintaining said fuel-support plate at a spaced location above the hearth.

4,326,497

TWO-ZONE HOT AIR OVEN FOR FOOD-LOADED CARTRIDGES

Raul Guibert, 9635 Oakmore Rd., Los Angeles, Calif. 90035

Division of Ser. No. 809,775, Jun. 24, 1977, which is a continuation-in-part of Ser. No. 776,772, Mar. 11, 1977, Pat. No. 4,112,916. This application Dec. 20, 1978, Ser. No. 971,381
Int. Cl.³ A47G *23/04*; F24C *15/32*
U.S. Cl. 126—261 **2 Claims**



1. The method of heating pre-cooked food contained in a tray which is initially at a predetermined cold temperature to bring the temperature of the food to an elevated service temperature which is below the temperature at which the food will be subject to re-cooking, and to maintain the food at this service temperature, said method comprising the steps of:

A. subjecting the tray during a heat-up phase to periodic pulses of air at a constant predetermined frequency flowing past the tray at a relatively high velocity, said pulses of air being separated by no-flow intervals during which heat transfers occurs within the food, said pulses of air being at a re-cooking temperature above said service temperature

to rapidly raise the temperature of the food from said cold temperature to said service temperature without raising the internal temperature of the food substantially above said service temperature; and B. thereafter during a service phase subjecting the tray to a flow of air which is heated to a temperature below said re-cooking temperature maintaining the food at the service temperature.

4,326,498

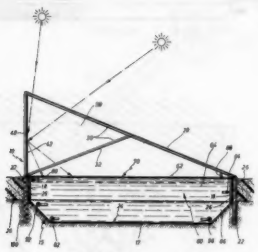
SOLAR CANAL

John E. Eckland, 600 Walker Hill La., Great Falls, Va. 22066

Filed Nov. 5, 1980, Ser. No. 204,186

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—415 **3 Claims**



1. A solar canal for the collection and storage of solar energy comprising:

(a) a fluid filled collection and storage pond wherein the bottom and sides of said pond are constructed of a dark, absorbing material and are optionally comprised of an insulating material and wherein the fluid contains at least one salt whose concentration is graduated so that the highest concentration is near the bottom and the lowest concentration is near the surface to produce convecting layers at the top and bottom of said pond and a non-convecting layer between said convecting layers;

(b) a thin film attached to the walls of said pond and in contact with the surface of said fluid, and a rigid cover plate over said pond wherein said film and said rigid cover plate are in communication with the sides of said solar pond so as to retain the fluid in an essentially airtight environment and are transparent or translucent to solar radiation and optionally opaque to thermal infrared radiation; and

(c) a rigid support wall located on the side of said pond farthest from the equator, said rigid support wall supporting said rigid cover plate at an angle to the surface of said pond and being reflective on its side adjacent said pond and rigid cover plate.

4,326,499

SOLAR WATER HEATING SYSTEM AND HEAT EXCHANGER THEREFOR

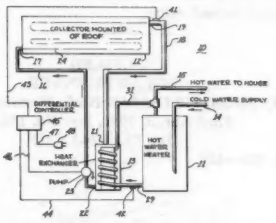
Marvin O. Koskela, 4222 E. Calle Redondo, Phoenix, Ariz. 85018

Filed Dec. 26, 1979, Ser. No. 106,539

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—420 **10 Claims**

1. A solar water heating system comprising a water storage tank including cold water inlet means and heated water outlet means and comprising a water utilization system, a solar collecting unit having cold liquid inlet means and heated liquid outlet means and comprising a heating liquid system, an independent heat exchanger disposed between said water utilization system and said heating liquid system, and means associated with said collector unit and said heat exchanger for draining the liquid from said solar collector and into said heat exchanger under certain predetermined temperature conditions, said independent heat exchanger comprises an outer tank having first inlet means of a predetermined size to accommodate a vent pipe and liquid flow for receiving heated liquid from said solar collecting unit and first outlet means for transferring cooled liquid to said solar collecting unit, a series of heat exchanger coils inside of said outer tank and having second inlet and second outlet means connected, respectively, to the cold water portion and the hot water portion of said water storage tank, said second outlet means of said heat exchanger being



adjacent the first inlet means of said outer tank, and a closed tank disposed interiorly of said series of heat exchanger coils and having a third outlet connected to said first outlet means, said inner tank having a volume sufficient to provide an air space in addition to the volume of liquid from the solar collection unit and having at least one opening therethrough communicating with the space between the inner and outer tanks adjacent said third outlet, and a gas vent pipe extending from the interior of said second tank through said first inlet means.

4,326,500

SOLAR RADIATION COLLECTOR

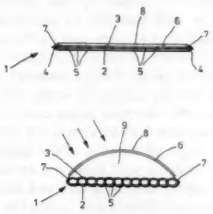
Winfried Bernhardt; Edgard Grundmann, and Rudolf Kroll, all of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jan. 30, 1980, Ser. No. 116,814

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1979, 2903828

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—426 **8 Claims**



1. In a solar radiation collector composed of a mat formed of a black foil member and a further foil member being preferably pervious to radiation, the two members being connected together along the outer edges of the mat and at interior locations of the mat to form an inlet and outlet and an extended flow path for a fluid heat carrier medium between the inlet and outlet, the collector further including a cover connected to the mat along opposed edges thereof and arranged to be disposed in the path of solar radiation toward the mat with an air space being defined between the mat and the cover, with the connections at interior locations of the mat serving to form parallel flow channels defining portions of the flow path and extending parallel to the opposed edges of the mat along which the cover is connected such that the dimension of the mat between the

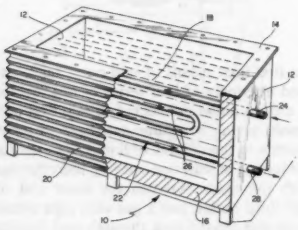
opposed edges at which the cover is connected has a first value when the mat does not contain heat carrier medium and is in a flattened state and a second value less than the first value when the mat is filled with heat carrier medium and is thus in an inflated state, the improvement wherein said cover is constructed such that when flat its dimension between said opposed edges has said first value, and said collector further comprises at least one elastically resilient body attached to said cover for causing said cover to assume an arched configuration which is concave toward said mat and defines a chamber with said mat when said dimension between said opposed edges attains said second value.

4,326,501

SOLAR FURNACE

Albert C. Jardin, 170 Old Mill Blvd., Warwick, R.I. 02889

Filed Apr. 3, 1980, Ser. No. 136,896
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—430 **2 Claims**



1. A solar furnace comprising a watertight tank, said tank being capable of storing phase change material that changes from solid to semi-solid to liquid form, said tank being constructed of steel, reinforced glass fiber or similar material or combinations thereof, said tank being of a design to absorb solar radiation through its outer front wall and into a phase change material which is in direct and total contact with said front outer wall, said tank being also of a design to store and hold heat within itself through the use of said phase change material, said tank also containing a conduit through its side outer wall and into and through said phase change material for passing water into and out of said tank, whereby solar heat will be transmitted into and stored by said phase change material and transferred by said material to said conduit to heat the water, wherein said heat storage and exchange materials comprise eutectic salt solutions such as calcium chloride hexahydrate or other similar phase change material, wherein said tank is provided with thickly insulated walls, the front wall being cut away, said cut away portion being covered by a corrugated plate adapted to receive the sun's rays, the corrugations on said plate being at an angle of the sum of the latitude of installation plus 10 degrees, wherein said tank is a rectangular tank, said tank being a self supporting structure and mounted outside the building on the ground surface and facing the sun, wherein said conduit comprises tubing extending into said tank, said tubing being bent to form a plurality of lengths of tubing in said tank.

4,326,502

SOLAR ENERGY COLLECTING SYSTEM

Ljubomir Radenkovic, Trg Oktob. Revol. 31, 37000 Krusevac, Yugoslavia

Continuation-in-part of Ser. No. 565,863, Apr. 7, 1975, Pat. No. 4,121,566. This application Oct. 20, 1978, Ser. No. 953,040
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—439 **3 Claims**

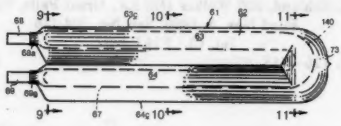
1. A solar energy collecting unit including:

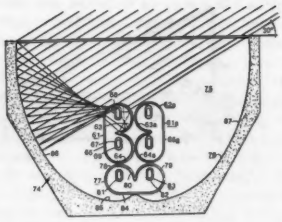
(A) solar energy collectors comprising:

(i) a first and a second elongated concavely shaped wall, both walls extending in generally parallel relation to each other, each wall having an innerside portion and an outerside portion, at least part of said first wall and at least part of said second wall being reflective of solar radiation;

(ii) a wall transmissive to solar radiation extending from said outerside portion of said first wall to said outerside portion of said second wall;

(iii) a first means for transferring energy away from said collector and positioned between said transmissive wall and said first wall and second means for transferring





energy away from said collector and positioned between said transmissive wall and said second wall; and

(iv) said first and said second means positioned with respect to said reflective walls and with respect to said transmissive wall to provide space capable of insulating said first and second means; and

(B) a generally concave reflective trough including a bottommost portion and two outerside portions;

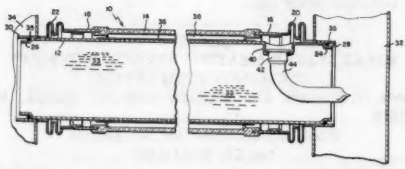
wherein a plurality of said collectors is positioned within said trough.

4,326,503

TURBULENT SOLAR COLLECTOR

Leonard W. Geier, Natick, and Kenneth F. Dunn, Arlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 3, 1980, Ser. No. 126,222
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—443 **10 Claims**



1. A solar collector comprising:

a first member having a solar energy transmissive wall portion;

fluid conduit means including a second member having a solar energy absorbent wall portion, the second member being sealed to said first member to form an evacuable chamber between said first member and said second member, the fluid conduit means directing a flow of heat conductive fluid along said wall portion of the second member; and

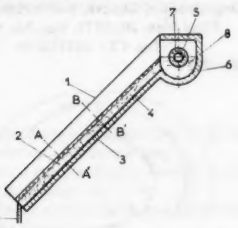
means extended in a fluid-tight manner through the second member into the fluid conduit means and disposed in communication with the chamber for evacuating the chamber.

4,326,504

TEXTILE SOLAR COLLECTOR

Yves Guadard, and Henri Guillemaud, both of Lyons, France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed Jun. 26, 1979, Ser. No. 52,443
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—449 **2 Claims**



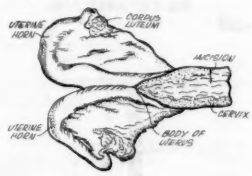
1. In a solar collector employing a running liquid to transmit heat collected from the sun comprising:
   (a) a frame having an inlet and an outlet; and
   (b) a textile layer supported within the frame, the textile layer being exposed to the sun and the collecting liquid entering the inlet being dispersed over the textile layer and withdrawn through the outlet, the improvement wherein said textile layer comprises two nonwoven textile layers of continuous superimposed filaments, each layer having a density different from that of the other layer, the nonwoven layer of lower density being the surface exposed to the sun and being impregnated with a synthetic resin.

4,326,505

SURGICAL PROCEDURE FOR EMBRYO TRANSPLANTS ON ANIMALS

Leo M. Cropsey, Golden, Colo., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Jan. 7, 1980, Ser. No. 109,802
Int. Cl.³ A61B *19/00*
U.S. Cl. 128—1 R **19 Claims**



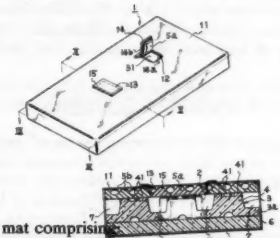
1. A method for implanting an embryo transplant from a donor mammal into the uterus of a recipient mammal, the method comprising the steps of:
   (a) positioning the uterine horn in the peritoneal cavity proximate to the vaginal wall;
   (b) inserting a cannula through the vaginal wall, through the wall of the uterine horn and into the lumen of the uterine horn of the recipient mammal;
   (c) introducing an embryo transplant into the lumen of the uterine horn through the cannula; and
   (d) withdrawing the cannula.

4,326,506

VIBRATILE MAT

Ichiro Kawabata, 282 Oaza Yono, Yono-shi, Saitama-ken, Japan

Filed Jul. 15, 1980, Ser. No. 169,101
Claims priority, application Japan, Jul. 16, 1979, 54-97730[U]; Dec. 3, 1979, 54-167401[U]
Int. Cl.³ A61H *1/00*
U.S. Cl. 128—33 **9 Claims**



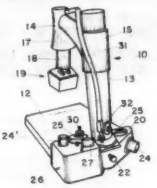
1. A vibratile mat comprising:
   a resonating member including a plate-like base and a plurality of convex walls arranged and fixed onto the top face of said plate-like base at a predetermined intervals, each convex wall having a number of wart-like small projections formed on the top face thereof, said plate-like base and convex wall being composed of a hard plastic material;
   vibrating means placed in a cavity formed by hollowing said resonating member; and
   a pad disposed on the top face of said resonating member to cover said resonating member, said pad being composed of a material softer than the material of said resonating member.

4,326,507

CPR PROTOCOL AND CARDIOPULMONARY RESUSCITATOR FOR EFFECTING THE SAME

Clare E. Barkalow, Comstock Park, Mich., assignor to Michigan Instruments, Inc., Grand Rapids, Mich.

Filed Nov. 20, 1979, Ser. No. 96,064
Int. Cl.³ A61H *23/00*
U.S. Cl. 128—54 **25 Claims**



1. A cardiopulmonary resuscitator comprising in combination:
   a reciprocatable cardiac compressor means for cyclically compressing a patient's chest;
   a ventilating means for simultaneously inflating the patient's lungs to a benign limiting pressure over a period encompassing at least one cycle of said compressor means; and
   a ventilator output control means for:
      (i) preventing retrograde and exhale flow from the patient's lungs during the systolic portion of the cycle of said compressor means thus providing for a pressure increase in the patient's lungs due to compression of the patient's chest, and

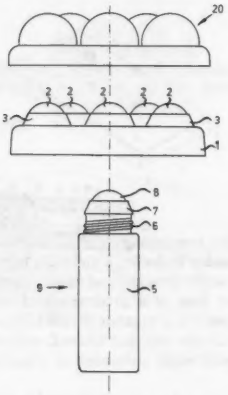
(ii) periodically venting the patient's lungs.

4,326,508

MASSAGING DEVICE

Robert Stauffer, Glattalstrasse 150, Rumlang, Switzerland (CH-8153)

Filed May 23, 1980, Ser. No. 152,660
Claims priority, application Switzerland, Jun. 7, 1979, 5306/79
Int. Cl.³ C13D 1/06
U.S. Cl. 128—57 5 Claims



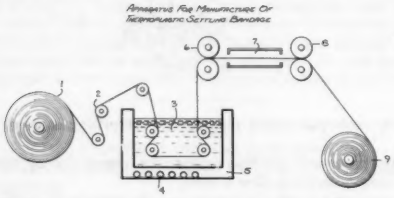
1. A manual massaging device comprising a base plate (1) having an upper surface and a central, threaded hole (4), a plurality of massaging balls (2) rollably mounted in said base plate in concentric, evenly spaced relation to said hole, and applicator container (5) for massaging oil equipped with an applicator ball (8) at its upper end threadably mounted in said hole and projecting downwardly away from said plate to provide a manipulating handle therefor.

4,326,509

THERMOPLASTIC COMPOSITION FOR SETTING BANDAGES AND A SOLVENTLESS PROCESS FOR THE MANUFACTURE THEREOF

Koji Usukura, Saitama, Japan, assignor to Tokyo Eizai Laboratory Co. Ltd., Tokyo, Japan

Filed Dec. 19, 1979, Ser. No. 105,200
Claims priority, application Japan, Dec. 27, 1978, 53/161383
Int. Cl.³ A61F 5/04; B05D 3/02; B32B 7/01
U.S. Cl. 128—90 12 Claims



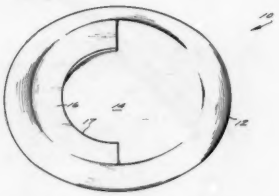
1. An orthopedic setting bandage which comprises
a thick, soft, woven or knit base fabric of natural or synthetic fibers impregnated with a thermoplastic composition comprising 60% to 80% by weight of a saturated linear polyester and 20% and 40% by weight of a resin having a low crystallinity and a low softening temperature which is selected from the group consisting of polyvinyl either, a copolymer of ethylene and vinylacetate, polyisoprene, polyisobutylmethacrylate, polyethylene, poly (4-hydroxyhexanoic acid) and poly (ethylene terephthalate-ethylene heptadiate) wherein,
said composition impregnated base fabric will harden to a waterproof, strong, rigid, nonporous, nontacky structure upon being warmed to about 45° C. and subsequently cooled.

4,326,510

BARRIER CONTRACEPTIVE TORUS

Richard G. Buckles, Basel, Switzerland, assignor to World Health Organization, Geneva, Switzerland

Filed Nov. 20, 1979, Ser. No. 96,156
Int. Cl.³ A61F 5/46
U.S. Cl. 128—127 10 Claims



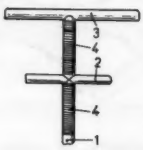
1. A contraceptive device comprising:
a torus of biocompatible materials sized to fit in a vagina;
means formed with the torus for providing a primary barrier preventing direct ejaculation into the cervix while allowing fluid drainage from the cervix;
said means comprising a pair of overlapping flaps, each extending into, and together completely covering, the interior opening of the torus; and
one of said flaps being arcuate in shape and extending approximately 180° around the opening in the torus, defining a circular segment central opening; and the other of said flaps being of flexible material and being generally circular in shape extending approximately 360° around the opening in the torus and overlapping portions of the said one flap over the entire arcuate extent thereof.

4,326,511

INTRAUTERINE CONTRACEPTIVE DEVICE

Clota E. Zimerman, 9 de Julio 532-A, Cordoba, Argentina

Filed Oct. 5, 1979, Ser. No. 82,283
Int. Cl.³ A61F 5/46
U.S. Cl. 128—130 4 Claims

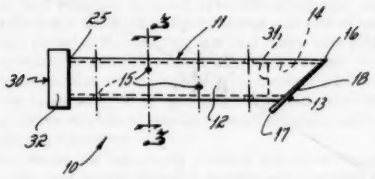


1. An intrauterine contraceptive device comprising a vector and contraceptor, said vector consisting of a vertical stem having two horizontal arms, the arm at the end of said stem being longer than the second arm, said vertical stem being twisted by a copper wire having a surface area of about 200–500 square mm wherein the second arm is located about the middle of the vertical stem and wherein said vertical stem is made from a plastic material.

4,326,512
COMPOSITE VENTILATION TUBE FOR THE MIDDLE EAR

Sidney A. Peerless, 2650 Kipling Ave., Cincinnati, Ohio 45239

Filed Feb. 14, 1980, Ser. No. 121,417
Int. Cl.³ A61F 11/00
U.S. Cl. 128—151 6 Claims

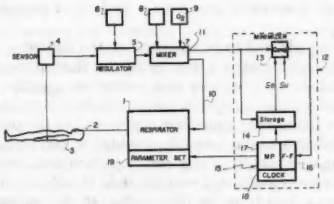


1. A composite ventilation tube assembly for the middle ear, said composite ventilation tube comprising:
an outer tube formed from a slightly flexible inert material, said outer tube including:
a thin-walled tubular section having a central bore extending completely therethrough;
an outwardly extending flange formed at one end of the tubular section; and
a plurality of transverse openings formed in the walls of said tubular section in fluid communication with said central bore;
a piston member formed of microporous plastic material, said piston member including:
a stem portion disposed within said tubular section and in frictional engagement therewith; and
a head disposed outwardly of said bore and adapted for engagement with the end of said tubular section;
said piston member being displaceable axially outwardly away from said flange in response to buildup in pressure within the middle ear.

4,326,513
PATIENT DATA CONTROLLED RESPIRATION SYSTEM

Volker Schulz, Mainz; Stefan Kunke, Wiesbaden, and Ulrich Heim, Reinfeld, all of Fed. Rep. of Germany, assignors to Drägerwerk AG, Fed. Rep. of Germany

Filed Jun. 30, 1980, Ser. No. 164,573
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1979, 2926747
Int. Cl.³ A61M 16/00
U.S. Cl. 128—203.14 7 Claims

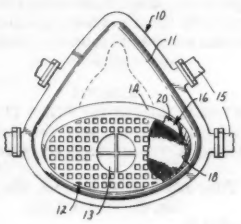


1. A respiration system for minimizing inspiration breathing gas oxygen partial pressure FiO_2 while maintaining a desired arterial oxygen partial pressure PaO_2 for a patient, including a respirator which supplies breathing gas to the patient at a plurality of respirator parameters, comprising:
PaO_2 sensor means for sensing actual arterial oxygen partial pressure of a patient and supplying a signal corresponding thereto;
mixing means for mixing oxygen plus at least one other gas to supply a breathing gas mixture having an actual oxygen partial pressure FiO_2, value to the respirator,
regulator means connected to said mixer for regulating the relative amounts of oxygen and the other gas in the breathing gas, said regulator means having a nominal PaO_2 value and receiving the PaO_2 sensor means signal for regulating the mixing means so that the actual PaO_2 value approaches the PaO_2 value;
comparator means connected to the mixing means and having a lower threshold value Su;
storage means connected to said mixing means and said comparator means for storing said actual FiO_2 value and supplying that value as the So value to said comparator means for a subsequent comparison step of said comparator means, said comparator means comparing said actual FiO_2 value from said mixing means with said Su and So values;
clocking means associated with said comparator means for establishing a time period as the duration of each comparison step;
parameter adjustment means connected to the respirator and the comparator means for selectively adjusting said plurality of respirator parameters, one at a time, in a selected direction and by a selected increment; and
control means operatively connected to said comparator means and said storage means for controlling the parameter adjustment means to select one of said plurality of respiratory parameters and adjust said one selected respiratory parameter in accordance with one of the following conditions:
(i) with the actual FiO_2 value being between the Su and So values during a comparison step duration, the control means being operable to cause the parameter adjustment means to make an adjustment of said one parameter in a positive or negative direction, store the direction of said adjustment, and select another of said plurality of respiratory parameters for adjustment;
(ii) with the actual FiO_2 value being outside the range between the Su and So values, said control means being operable to maintain the So value of the previous comparison step in said storage means, reverse the direction of adjustment of the previous selected parameter and adjust the previous selected parameter by a selected increment in the reverse direction, and adjust the one selected parameter in a position or negative direction.

4,326,514
CARTRIDGE RESPIRATOR WITH SERVICE LIFE INDICATOR

Gilbert L. Eian, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 20, 1980, Ser. No. 161,441
Int. Cl.³ A62B 7/10
U.S. Cl. 128—202.22 5 Claims



1. A respirator for protection against toxic airborne material in the atmosphere comprising a shell, a canister or cartridge having a transparent sidewall within which is supported a gas/vapor sorbent bed, and a colorimetric indicator comprising a flat, sheet-like self-supporting structure of said chlorimet-

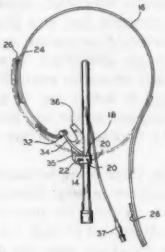
ric indicator coated onto a transparent substrate in a dry coating weight in the range of 13 to 62 g/m^2 positioned along and parallel to a substantial portion of the inner transparent sidewall of said respirator canister or cartridge such that the colorimetric indicator substance is oriented towards the sorbent bed, said colorimetric indicator capable of undergoing an irreversible change in color concomitant with exposure to concentrations of toxic vapors and gases which appears as an irregular linear boundary between reacted and unreacted areas of said indicator substance which is viewable through the sidewall of said respirator canister or cartridge to visually indicate remaining capacity of the sorbent bed for said toxic airborne material.

4,326,515

ENDOTRACHEAL TUBE RETAINER

Mark A. Shaffer, 5455 N. Sheridan Rd., Chicago, Ill. 60640, and Frank J. Baker, II, 456 Poplar, Elmhurst, Ill. 60126

Filed Apr. 14, 1980, Ser. No. 140,175
Int. Cl.^{3} A61M *25/02*
U.S. Cl. 128—207.17 **21 Claims**



1. A device for holding an endotracheal tube comprising:

a tie plate curved to rest along the outside of a patient's cheek, said tie plate having a first tie-plate end;

a bite plate curved to extend along the inside of a patient's cheek and between a patient's upper and lower gums, said bite plate having a first bite-plate end;

a member connecting said first tie-plate end with said first bite-plate end so as to form a channel between them, said tie plate and bite plate adapted to grip a patient's cheek in the channel between them so as to maintain said tie plate, said bite plate and said member in a fixed position in a patient's mouth, said tie plate, said bite plate and said member sized and shaped to extend only about half-way across a patient's mouth so as to permit access to a patient's mouth cavity while said device is in the patient's mouth;

means for securing an endotracheal tube to said member, said bite plate having a width sufficiently greater than said tube to prevent a patient from biting said tube; and

means for securely fixing and holding said member tie plate, bite plate and securely in patient's mouth.

4,326,516

INTRACATHETER-INTRAVENOUS TUBING LOCK

Kenneth E. Schultz, 402 NW. 94th La., Coral Springs, Fla. 33060, and Mary Craycraft, 6820 SW. 43rd Ct., Davie, Fla. 33314

Filed Jan. 2, 1980, Ser. No. 109,132
Int. Cl.^{3} A61M *5/00*
U.S. Cl. 128—214 R **11 Claims**

1. In an intravenous supply tubing having a connector and an intracatheter insert portion, a locking device for releasably securing said intravenous supply tubing to said intracatheter insert connector, comprising:

a knob projecting from said intravenous supply tubing proximate said connector of said intracatheter insert when said intravenous supply tubing and said intracatheter insert are in an operating position; and

locking means pivotably attached at one end to said connector of said intracatheter insert to pivot about an axis which

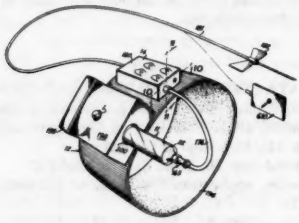
intersects the longitudinal axis of at least one of said intravenous supply tubing and said intracatheter insert substantially at a right angle for placement over said knob to thereby secure said intravenous supply tubing to said intracatheter insert.

4,326,517

SELF CONTAINED INJECTION SYSTEM

Douglass G. Whitney, 2518 W. Wesley Rd., and John K. Martin, III, 2837 Ridge Wood Cir., both of Atlanta, Ga. 30327

Division of Ser. No. 1,091, Jan. 8, 1979, Pat. No. 4,273,122, which is a continuation-in-part of Ser. No. 741,528, Nov. 12, 1976, Pat. No. 4,150,672, and Ser. No. 964,953, Nov. 30, 1978, Pat. No. 4,235,235. This application Mar. 27, 1981, Ser. No. 248,246
Int. Cl.^{3} A61M *5/20*
U.S. Cl. 128—214 F **3 Claims**



1. A self-contained, portable fluid dispensing device adapted to be mounted on a patient for injecting fluid into a patient at an average prescribed rate over a prolonged period of time including:

a housing adapted to be mounted on the patient;

a container carrying a supply of the fluid removably attached to said housing at a prescribed position on said housing about an injection axis, said fluid container defining a fluid outlet therefrom connected to the patient and including a piston movably mounted in said container for movement axially along said injection axis, said piston operatively associated with the fluid in said container so as to force fluid from the fluid outlet into the patient as said piston is moved in a first direction along said injection axis toward the fluid outlet,

expelling means carried by said housing for selectively moving said piston in said first direction toward the fluid outlet to force the fluid into the patient, said expelling means including a first threaded member carried by said housing in registration with said injection axis and axially fixed with respect to said injection axis; a second threaded member threadedly engaging said first threaded member

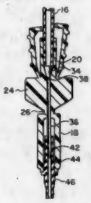
so that relative rotation between said threaded members causes said second threaded member to be axially moved along said injection axis to selectively engage and move said piston in said first direction toward the fluid outlet to force the fluid out of the fluid outlet in said container into the patient; a drive member mounted in said housing coaxially with said second threaded member about said injection axis, said drive member axially fixed with respect to said injection axis and rotatable about said injection axis; and a slip joint interconnecting that end of said second threaded member opposite said piston with said drive member so that said second threaded member is axially movable with respect to said drive member while remaining rotationally fixed with respect to said drive member whereby rotation of said drive member rotates said second threaded member; and

drive means for selectively rotating said drive member to rotate said second threaded member and cause said second threaded member to force said piston in said first direction toward said outlet.

4,326,518
SEPARABLE INTEGRAL DONOR CONNECTOR WITH MANUAL CLAMPING MEANS

Ronald A. Williams, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 7, 1980, Ser. No. 138,031
Int. Cl.³ A61M 5/00
U.S. Cl. 128—214.2 **8 Claims**



2. A device for supporting a needle and for attaching the needle in flow communication with flexible conduit, said device comprising

a main body including means defining a fluid passage which extends axially therethrough and which includes, at a first end thereof, means for attaching the needle in flow communication with said fluid passage and, at a second end thereof, means for attaching the flexible conduit in flow communication with said fluid passage and, thus, the needle,

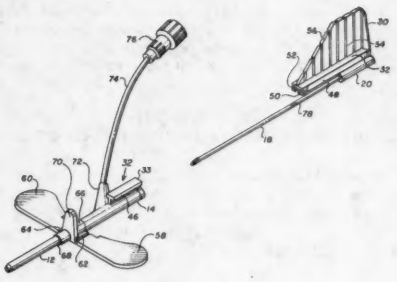
first and second jaw members projecting outwardly beyond said main body adjacent to said second fluid passage end on opposite sides of and generally facing the axis of said fluid passage, each of said jaw members including, at its terminus, an arm portion extending radially inwardly toward the axis of said fluid passage, one of said arm portions being spaced a greater distance from said main body than the other one of said arm portions, and

means operatively connecting said first and second jaw members to said main body for cooperative movement between a generally open position, in which said arm portions are disposed in a spaced apart relationship on opposite facing sides of the axis of said fluid passage to afford fluid flow through the flexible conduit attached thereto, and a generally closed position, in which said arm portions are disposed in a mutually overlapping portion along the axis of said fluid passage to pinch between said overlapping arm portions a section of the flexible conduit and obstruct fluid flow therethrough.

4,326,519
VENIPUNCTURE DEVICE

Herbert F. D'Alo, Crystal Lake, and Andrew J. Muetterties, Gages Lake, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 21, 1980, Ser. No. 123,522
Int. Cl.³ A61M 5/00, 25/00
U.S. Cl. 128—214.4 **13 Claims**



1. An improved venipuncture device comprising:

catheter means having catheter hub means attached thereto at a first end;

needle means having needle hub means attached thereto at a first end and a sharpened tip at a second end, said needle means extending coaxially through said catheter means with said sharpened tip extending from said catheter means at a second end and being adapted for insertion and removal from said catheter means; and

a fin member extending substantially vertically from said needle hub means and longitudinally along a substantial portion of the length of said catheter hub means whereby said device may be easily grasped, balanced and manipulated during venipuncture;

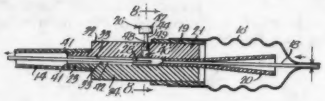
guide track means longitudinally disposed along the exterior of said catheter hub, along the base portion of said fin member and along said needle hub, said guide track means being constructed and arranged for the slidable attachment or detachment of said needle hub means to said catheter hub means, said guide track means further being effective to prevent rotation of said needle means within said catheter means;

said base portion of said fin member being disposed coaxially with and extending vertically from said guide track means so as to facilitate kinesthesis, ease of venipuncture, and joinder or separation of said catheter hub means from said needle hub means by means of said fin member.

4,326,520
BRAKE-ACTUATED CATHETER FEEDER

Ralph D. Alley, 13 Spring Street Rd., Loudonville, N.Y. 12211

Continuation of Ser. No. 17,540, Mar. 5, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 218,497
Int. Cl.³ A61M 5/00
U.S. Cl. 128—214.4 **14 Claims**



1. A device for aiding in threading a catheter for human or animal use, comprising:

an element formed from first and second similarly shaped parts and having a bore therethrough for receiving a catheter;

means for aligning said first and second parts;

independent means in said bore overlapping a portion of said catheter, said independent overlapping means is a ferrule concentrically disposed about the catheter;

brake means in said element for selectively urging said independent ferrule received within said bore between said brake means and said catheter into engaging and disengaging contact with said catheter so that when said brake means is engaged, said catheter remains in a fixed position with respect to said element, and when said brake means is disengaged, said catheter is able to pass freely in either direction through said bore; and

means for retaining the first and second parts together.

4,326,521

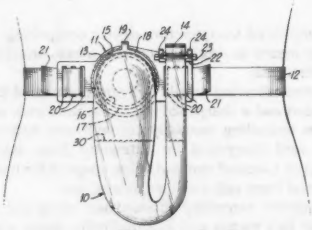
APPLIANCE FOR THE TREATMENT OF COLOSTOMY AND THE LIKE

Arthur E. Marsan, 240 Ferrari Ct., El Paso, Tex. 79912

Continuation-in-part of Ser. No. 728,517, Nov. 11, 1976, abandoned. This application Feb. 28, 1980, Ser. No. 125,344

Int. Cl.³ A61F 5/44

U.S. Cl. 128—283 **1 Claim**



1. An improved appliance for the treatment of colostomy and the like, comprising a pouch having a receiving end and a drain end, a gasket having plural portions formed into a unitary structure having an opening for reception of the stoma, one such portion forming an annular peripheral lip around the stoma opening at its outlet end, another such portion forming a ring member hinged to the gasket, the receiving end of the pouch adapted to be inserted by hand into the center of the ring member, the ring member adapted to be moved by hand on its hinge to a position in which it coacts with said lip and presses an annular portion of the receiving end of the pouch into annular engagement with said lip to secure the pouch to the gasket, another such portion forming spaced jaws, and still another such portion forming a clamping bar hinged to the gasket and adapted to be moved by hand on its hinge after the drain end of the pouch has been placed by hand between said jaws to clamp said drain end to the gasket with said drain end closed.

4,326,522

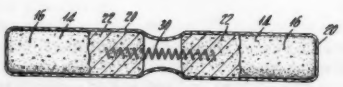
MESH-COVERED BOLUS

Jorge Guerrero, Pennington; Alice D. Mellon, Bridgewater; Charles G. Fritz, Basking Ridge, and Namassivaya Doddi, Manville, all of N.J., assignors to Pitman-Moore, Inc., Washington Crossing, N.J.

Filed Jun. 9, 1980, Ser. No. 157,591

Int. Cl.³ A61M 7/00

U.S. Cl. 128—/260 **2 Claims**



1. A rumen-retentive bolus comprising a medicament admixed in a bioerodible sustained-release matrix; a mesh made of a nonabsorbable material completely encasing said medicament-containing matrix; retention means to prevent the bolus from being regurgitated by the ruminant in less than two weeks which retention means is to have the medicament-containing matrix contain at least two matrix segments capable of changing their positions relative to each other after administration into the rumen, and wherein at least two of said matrix segments are joined together by flexible resilient means in the form of a coiled spring, so that the bolus segments can be formed into a shape suitable for administration from a bolling gun, and wherein dissolvable shape holding means are used to keep it in said shape until after it has been administered into the rumen and the shape holding means dissolved by the ruminal fluids, whereupon the bolus changes its shape to become sufficiently large that it cannot be regurgitated.

4,326,523

METHOD OF SUPPLYING MICRONUTRIENTS TO ANIMALS

Glen W. Wolfrom; Robert D. Williams, both of Terre Haute, Ind.; Herbert T. Peeler, Northbrook, Ill., and Richard E. Ivy, Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Aug. 25, 1980, Ser. No. 180,798

Int. Cl.³ A61M 7/00

U.S. Cl. 128—260 **16 Claims**

1. A method of supplying a micronutrient to meat-producing animals comprising formulating the micronutrient in a slow release, absorbable pellet in combination with a biocompatible, absorbable carrier, and subcutaneously implanting said pellet in a meat-producing animal to thereby slowly release said micronutrient directly into the animal's circulatory system as said pellet is absorbed, said micronutrient being selected from the group consisting of suitable compositions containing iron, copper, selenium, zinc, manganese, iodine, cobalt, molybdenum, chromium, silicon, biotin, vitamin E and vitamin B_{12}, and said absorbable carrier being selected from the group consisting of lactose, fibrin, methylcellulose, collagen, cholesterol, carbowax, beeswax, dibutylphthalate (DBP), polyvinylpyrolidone (PVP), zinc stearate, polyactides including α-hydroxypropionic acid, polyethylene glycol (PEG), sugar-starch combinations and suitable combinations of the above.

4,326,524

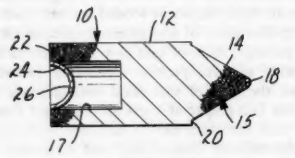
SOLID DOSE BALLISTIC PROJECTILE

James F. Drake, Jr., Minneapolis, and G. Phillip Rambosek, Shafer Township, Chisago County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 30, 1980, Ser. No. 192,297

Int. Cl.³ A61M 7/00

U.S. Cl. 128—260 **18 Claims**



1. A solid dose ballistic projectile shaped for penetrating the epidermal layer of a living animal and lodging totally within the tissues of the animal and capable of releasing biologically active ingredient into said tissue of said animal when lodged therein, the projectile comprising in a major portion a body consisting essentially of a uniform cohesive mixture of from about 70 to 95 weight percent of grindable solid particles, at least about 90 weight percent of said particles having an aver-

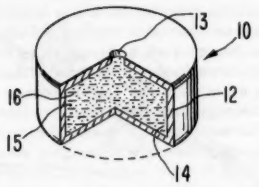
age diameter between about 7 and 25 micrometers, and at least a biologically effective amount of said particles comprising biologically active material, and from about 5 to 30 weight percent of a biologically inert, cohesive binder adhered to said particles, said binder being more compressible than said grindable solid particles, and said body being capable of providing structural integrity to said projectile when ballistically propelled at a muzzle velocity of up to about 475 m/sec and implanted within said tissues of said animal.

4,326,525

OSMOTIC DEVICE THAT IMPROVES DELIVERY PROPERTIES OF AGENT IN SITU

David Swanson, Palo Alto, and David Edgren, El Granada, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Oct. 14, 1980, Ser. No. 196,219
Int. Cl.³ A61M *7/00*
U.S. Cl. 128—260 **13 Claims**



1. A process for modifying the solubility of a beneficial agent in an osmotic device, which process comprises:

A. imbibing an exterior fluid into the osmotic device, the device comprising:

1. a semipermeable wall surrounding and forming;
2. a compartment containing a beneficial agent, and a buffer that is soluble in the fluid and exhibits an osmotic pressure gradient across the wall against the fluid;
3. a passageway in the wall connecting the exterior of the device with the compartment; and,

B. reacting the agent and the buffer in the presence of fluid imbibed into the compartment, thereby modifying the agent to produce a different agent that is soluble in the fluid and exhibits an osmotic pressure gradient across the wall against the fluid, and which agent can be delivered through the passageway from the device.

4,326,526

DIALYSATE BAG ASSEMBLY FOR CONTINUOUS AMBULATORY PERITONEAL DIALYSIS

Robert T. Buck, Raleigh, and Charles R. Horres, Chapel Hill, both of N.C., assignors to Becton, Dickinson and Company, Paramus, N.J.

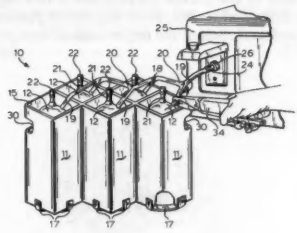
Filed Sep. 18, 1980, Ser. No. 188,394
Int. Cl.³ A61J *1/00*
U.S. Cl. 128—272 **15 Claims**

1. A dialysate bag assembly for continuous ambulatory peritoneal dialysis comprising:

a substantially flattened, expansible container having a plurality of compartments;

a plurality of substantially flattened, expansible dialysate bags, each bag being removably positioned in one of said compartments, each bag having a dialysate inlet opening and a dialysate outlet opening with removable closure means to close said outlet openings;

a main feedline adapted to be connected at one end to a primary source for delivering dialysate to said bags, said feedline being detachably connected to said inlet opening on each of said bags for filling same with dialysate, said bags and said container adapted to expand as said bags are being filled; and



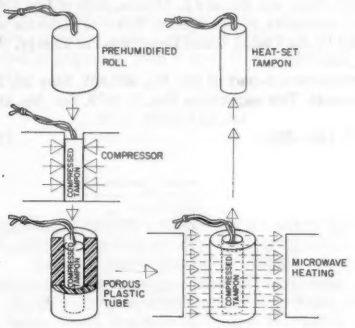
means associated with each of said inlet openings to close same in liquid-tight fashion after the delivery of dialysate is completed.

4,326,527

MICROWAVE HEAT SETTING OF TAMPON

Edward G. Wollangk, Oshkosh, and Amnuey Lilaonitkul, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 27, 1980, Ser. No. 153,010
Int. Cl.³ A61F *13/20*
U.S. Cl. 128—285 **7 Claims**



1. A process for heat-setting a radially compressed tampon comprising:

(a) compressing a prehumidified tampon; said compressed tampon having a diameter less than its height;

(b) inserting said compressed tampon in an open ended microwave transparent tube having openings along the longitudinal axis of said tube;

(c) subjecting said tampon to microwave heating; and

(d) drying said tampon.

4,326,528

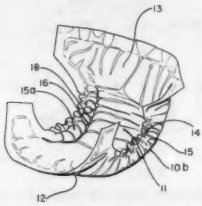
ELASTIC LEGGED DIAPERS

Lenore S. Ryan; Frank C. Murray, both of Appleton; Ann M. Sprangers, Neenah; William J. Santoski, Appleton; Michael A. Sciaraffa, Greenville; Kent W. Abel, Black Creek, and Harold F. Donnelly, Menasha, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 7, 1980, Ser. No. 138,255
Int. Cl.³ A61F *13/16*
U.S. Cl. 128—287 **25 Claims**

1. In a unitary elasticized disposable diaper having a fluid pervious facing, a fluid impevious backing essentially coterminous therewith and an absorbent material positioned between said facing and said backing, a waist portion at each end of said

diaper for securement about the waist of the baby when the diaper is worn, and an elasticized crotch portion the end waist portions having elastic attached near the periphery of each diaper side in the crotch portion and a flex region positioned inward from said elastic, absorbent being present between said elastic and said region, the improvement comprising providing



the diaper with sufficient rigidity so that the lowest profile at the crotch area of the baby when the baby is standing is planar or upwardly arcuate in the area in the crotch between the predetermined directional change formed by the flex regions and the area between the flex regions and the elastic is planar and tends to remain planar even when the baby is sitting thereby forming a containment pocket.

4,326,529

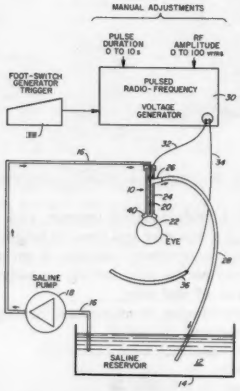
CORNEAL-SHAPING ELECTRODE

James D. Doss, and Richard L. Hutson, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 909,865, May 26, 1978, abandoned. This application Dec. 5, 1979, Ser. No. 100,664

Int. Cl.³ A61B *17/36*

U.S. Cl. 128—303.1 **15 Claims**



1. A circulating saline electrode for changing corneal shape comprising:

a tubular nonconductive electrode housing having a longitudinal axis and at one end an annular expanded base, said base having a surface substantially matched to the subject corneal suface of an eye;

a tubular conductive electrode having a longitudinal axis positioned within and longitudinally aligned with said tubular housing, said electrode having agenerally hemispherical head disposed in the vicinity of said annular base of said housing, adapted to be positioned near to but not physically touching a cornea against which said housing may be placed, said electrode head having at least one orifice therein:

means for circulating an electrically conductive coolant through said tubular electrode and said orifice therein and thence through said tubular housing; and

means for applying electromagnetic energy at a radiofrequency wavelength through said tubular electrode to selectively heat the subject cornea and thereby change its shape.

4,326,530

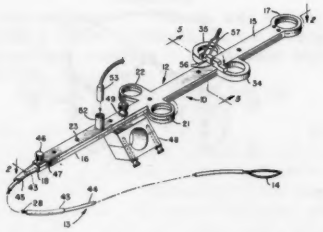
SURGICAL SNARE

George J. Fleury, Jr., 1005 Abbey Way, McLean, Va. 22101

Filed Mar. 5, 1980, Ser. No. 127,321

Int. Cl.³ A61B *17/39*

U.S. Cl. 128—303.14 **8 Claims**



1. A surgical instrument having a snare in the form of a loop useful in performing colonoscopic polypectomy comprising:

(a) an elongated flexibly bendable open ended sheath having proximal and distal ends;

(b) a folded on itself flexible cable positioned in said sheath and capable of being reciprocatingly moved therein whereby a portion of the folded cable describes a loop and is capable of being selectively advanced to extend beyond the distal end of the sheath;

(c) an elongated housing means having cable receiving means;

(d) said sheath having its proximal end secured to said elongated housing and in alignment with said cable receiving means;

(e) said double cable being of sufficient length whereby end portions of said cable extend beyond the proximal end of said sheath and into said cable receiving means in said housing means;

(f) two linear drive means for said folded on itself cable, each including an elongated rigid longitudinally movable means each having handle means;

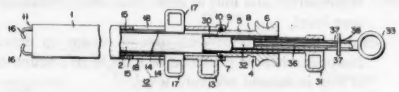
(g) guide means on said housing adapted and constructed to permit independent reciprocating motion of each of said elongated rigid longitudinally movable means;

(h) one end portion of said cable being attached to one of said elongated rigid longitudinally movable means of said linear drive means and the other end portion of said cable being attached to the other of said elongated longitudinally movable means of said linear drive means whereby movement of said elongated rigid longitudinally movable means will selectively advance or withdraw said cable through the distal end of said sheath thereby controlling the size of the loop and relative movement of one of said elongated rigid longitudinally movable means relative to the other will control the configuration of the loop and selective means is provided whereby said two linear drive means may be locked together so that said linear drive means may be moved in unison.

4,326,531
DEVICE FOR OPERATING A COELIAC TUBULAR MEMBER-CLOSING IMPLEMENT

Hideki Shimonaka, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1979, Ser. No. 76,321
Claims priority, application Japan, Sep. 20, 1978, 53-115693
Int. Cl.[3] A61B *17/12*
U.S. Cl. 128—326 4 Claims



1. A device for operating a coeliac tubular member-closing implement comprising:

an elongated outer tube having two ends;

a hollow cylindrical needle reciprocably inserted into said outer tube and having two ends, one end thereof being obliquely cut off to provide a sharp tip and containing a coeliac tubular member-closing implement comprising a penetrating member having two ends and a plurality of linearly connected frustoconical engagement members formed between said two ends of said penetrating member with a diameter progressively increasing toward said one end of said needle, a first stop fixed to one end of said penetrating member which is nearer to said one end of said needle and a second stop having a frustoconical bore complementary to said engagement members and allowing for passage of the other end of said penetrating member and the other end of said needle being adapted to project from one end of said outer tube;

a coeliac tubular member-holding forceps extending lengthwise of said outer tube between said outer tube and said needle and having two ends, one end thereof being operated to reciprocate said forceps for allowing the other end thereof to project from, and recede into said one end of said needle;

a push tube reciprocably inserted into said needle for pushing said first stop of said coeliac tubular member-closing implement out of said one end of said needle;

a drive tube reciprocably inserted into said push tube for moving said second stop of said coeliac tubular member-closing implement toward said first stop thereof; and

an elongated holding member for holding said coeliac tubular member-closing implement, said holding member extending through said drive tube and having two ends, one end thereof being detachably connected to the other end of said penetrating member of said coeliac tubular member-closing implement and the other end thereof being adapted to project from said one end of said outer tube.

4,326,532
ANTITHROMBOGENIC ARTICLES

Walton J. Hammar, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 6, 1980, Ser. No. 194,576
Int. Cl.[3] A61M *25/00*; B01D *13/00*; A01N *43/16*
U.S. Cl. 128—349 R 18 Claims

1. A medical article of manufacture having a layered nonthrombogenic surface comprising:

a natural or synthetic polymeric substrate,

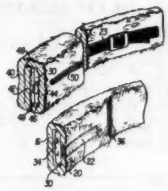
a chitosan coating bonded to said polymeric substrate, and

an antithrombotic agent bonded to said chitosan coating.

4,326,533
COOLANT BAND

Mary M. Henderson, 4401 Tyne Blvd., Nashville, Tenn. 37215

Division of Ser. No. 867,582, Jan. 6, 1978, Pat. No. 4,204,543.
This application Oct. 29, 1979, Ser. No. 88,848
Int. Cl.[3] A61F *7/00*
U.S. Cl. 128—402 3 Claims



1. A coolant band comprising:

(a) an annular strip of textile material consisting of a first layer having an outwardly presented surface thereon and a second layer having an inwardly presented surface thereon, said first and second layers of material forming a pocket means therebetween,

(b) coolant means containing a freezable liquid or semi-liquid material in said pocket means;

(c) slit means in said inwardly presented surface of said second layer of textile material to form an opening for insertion and removal of said coolant means into said pocket means; and

(d) means associated with said strip to maintain said inwardly presented surface and said pocket in direct contractive engagement with a part of the anatomy to be cooled.

4,326,534
TRANSCUTANEOUS ELECTRICAL MUSCLE STIMULATION FOR TREATMENT OF SCOLIOSIS AND OTHER SPINAL DEFORMITIES

Jens Axelgaard, 10440 Paramount Blvd., J-180, Downey, Calif. 90241; David C. Howson, 4505 Oakland Ave. South, Minneapolis, Minn. 55407, and John A. Perhay, W. Hidden Valley Rd., Savage, Minn. 55378

Filed Jun. 21, 1979, Ser. No. 50,760
Int. Cl.[3] A61N *1/36*
U.S. Cl. 128—421 15 Claims

LOCATE APICAL VERTEBRA ON MAJOR CURVE
POSITION ELECTRODES WITH RESPECT TO RIB CONNECTED TO APICAL VERTEBRA
APPLY PREDETERMINED PATTERN OF PULSES TO ELECTRODES

1. A method of treating spinal curvature in the thoracic or thoracolumbar region of human patients comprising the steps of:

(a) locating the apical vertebra on the major curve of the patient's spine;

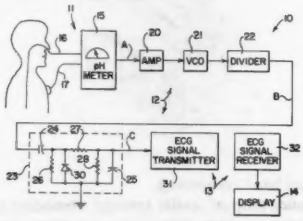
(b) positioning a pair of electrodes (1) on the outer skin surface of said patient, (2) lying within a band of muscles at a lateral trunk location and (3) generally symmetrically above and below the rib connected to said apical vertebra on the convex side of said major curve; and

(c) repetitively applying a predetermined pattern of electrical pulses to said electrodes for evoking contraction and relaxation of preselected muscle groups in a zone defined by the location of said pair of electrodes.

4,326,535
CIRCUIT AND METHOD FOR THE RADIOTELEMETRY OF ESOPHAGEAL PH IN AN ECG RADIOTELEMETRY SYSTEM

Charles R. Steffel, Munroe Falls, and Bruce C. Taylor, Kent, both of Ohio, assignors to Akron City Hospital, Akron, Ohio

Filed May 13, 1980, Ser. No. 149,427
Int. Cl.[3] A61B 5/00
U.S. Cl. 128—631 **12 Claims**



1. A circuit for radiotelemetry of an esophageal pH signal in an electrocardiogram (ECG) signal radiotelemetry system, comprising:

means for monitoring esophageal pH and generating a signal proportional thereto;

waveform converter means for receiving said signal from said means for monitoring esophageal pH and converting the same to a signal whose waveform is similar to an ECG waveform and one of whose electrical parameters is proportional to esophageal pH;

transmitter means for receiving said converted signal from said waveform converter means and broadcasting the same upon a radio frequency carrier;

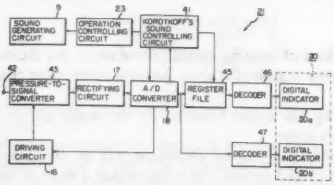
receiver and demodulator means for receiving said broadcast signal and demodulating the same to obtain said converted signal similar to an ECG waveform; and,

display means receiving said demodulated, converted signal whose waveform is similar to an ECG waveform and displaying indicia of esophageal pH.

4,326,536
SPHYGMOMANOMETER

Fumio Kitagawa, and Tsutomu Ichinomiya, both of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

PCT No. PCT/JP78/00024, § 371 Date Jul. 16, 1979, § 102(e) Date Jul. 11, 1979, PCT Pub. No. WO79/00294, PCT Pub. Date May 31, 1979
PCT Filed Nov. 13, 1978, Ser. No. 128,355
Claims priority, application Japan, Nov. 15, 1977, 52-138149
Int. Cl.[3] A61B 5/02
U.S. Cl. 128—682 **1 Claim**



1. A sphygmomanometer comprising:

first means for selectively feeding pressurized air into a cuff wound on an upper arm or the like and exhausting air from said cuff,

second means connected to the cuff for detecting Korotkoff's sound,

automatic control means operably connected to said first and second means for:

actuating said first means in a manner pressurizing said cuff to a given pressure,

sensing the output of said second means to detect the presence of Korotkoff's sound signals at said given pressure,

reactuating said first means in response to said sensing of Korotkoff's sound signals, from said second means to repressurize said cuff at least once to an increased pressure level,

sensing the output of said second means to detect the disappearance or presence of Korotkoff's sound signals at said increased pressure level,

switching said first means to an exhaust mode to depressurize said cuff in response to the sensed disappearance of Korotkoff's sound signals, and

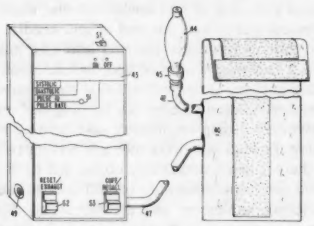
means for detecting and digitally indicating the systolic and diastolic blood pressure values during said exhaust mode,

said indicator means including sound generating means for generating continuous sounds during said exhaust mode until the reappearance of Korotkoff's sounds and thereafter generating sounds synchronized with Korotkoff's sounds.

4,326,537
METHOD AND APPARATUS FOR PERFORMING NON-INVASIVE BLOOD PRESSURE AND PULSE RATE MEASUREMENTS

Michael E. Croslin, 37 Bow St., Forest Hills Gardens, N.Y. 11375

Division of Ser. No. 64,194, , Pat. No. 4,271,844, which is a continuation-in-part of Ser. No. 499, Jan. 2, 1979, abandoned, and a continuation-in-part of Ser. No. 774,970, Mar. 7, 1977, abandoned, said Ser. No. 499, is a continuation-in-part of said Ser. No. 774,970. This application Nov. 19, 1980, Ser. No. 208,260
Int. Cl.[3] A61B 5/02
U.S. Cl. 128—687 **10 Claims**



1. A method for determining heart rate for use in an instrument which includes a pressurized cuff for occluding an artery and means for periodically sampling the instantaneous cuff pressure, comprising the steps of:

(a) utilizing successive samples taken for detecting and validating the presence of sequential blood pressure pulses, a plurality of samples being used for the detection of each pulse and an individual analysis being performed on each such plurality of samples to validate the presence of the pulse represented thereby,

(b) counting the number of pulses detected in step (a) during a fixed time interval to determine the pulse rate, and

(c) validating the count formed in step (b) only if at least one additional pulse is detected following said fixed time interval.

4,326,538

METHOD AND APPARATUS FOR ANALYSIS OF ESSENTIALLY PERIODIC SIGNAL SEQUENCES

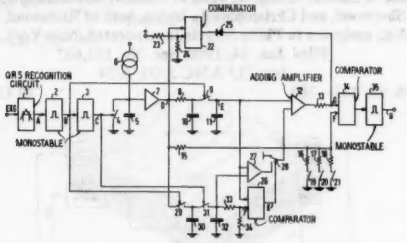
Kurt Weigert, Nuremberg, and Claudius Molz, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 9, 1980, Ser. No. 138,709

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 2916067

Int. Cl.[3] A61B 5/04

U.S. Cl. 128—702 18 Claims



1. A method for the analysis of essentially periodic signal sequences, in particular physiological signals such as EKG signals or the like, said method comprising

(a) generating a measuring voltage which changes in value in proportion to the duration of a currently occurring signal period between individual signal events,

(b) generating a mean value signal which is a function of a mean value of the measuring voltage in the preceding signal period,

(c) generating a further signal which is a function of the signal period duration so as to represent the degree of prematureness of a signal event which has taken place,

(d) adjusting the mean value signal relative to the measuring voltage according to said further signal,

(e) comparing the mean value signal with the measuring voltage after the relative adjustment thereof according to the preceding step (d), and generating a comparison signal when the measuring voltage and the mean value signal, with the relative adjustment thereof, reach a predetermined comparison relationship, the adjustment of the mean value signal relative to the measuring voltage in step (d) being such that signal pauses which are brought about solely due to a prematurely occurring signal event do not result in the generation of a comparison signal, and

(f) transmitting a missing-individual-event-recognition signal in response to the comparison signal so as to indicate missing individual signal events in the essentially periodic signal sequence while signal pauses which are brought about solely due to prematurely occurring signal events do not lead to the transmission of a missing-individual-event-recognition signal.

4,326,539

PROCESS FOR MEASURING THE CARDIAC VOLUME

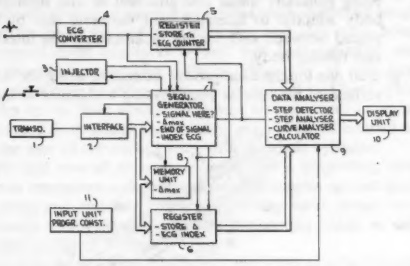
Wladimir Obermajer, 1 villa Leandre, 75018 Paris, France

Continuation-in-part of Ser. No. 964,166, Nov. 28, 1978, abandoned. This application Mar. 27, 1980, Ser. No. 134,290

Int. Cl.[3] A61D 5/02

U.S. Cl. 128—713 7 Claims

1. A process for the measurement of cardiac volumes of the beating heart, in pulsed flow conditions by dilution of a quantity Q_I of tracer injected upstream of a ventricle, at controlled injection flow D_I and during a controlled time t_I comprising the steps of: recording the stepwise tracer concentration Δ_n during a number N of complete cardiac periods n, by means of a transducer downstream of the injection site; and determining the cycle M at which maximum step concentration value Δ_M occurs, as well as the mean cardiac cycling intervals, i.e. the cardiac period τ_n, whereby forming the following summation products:



$$S = \bar{\tau}(1;N) \cdot \sum_{n=1}^{N} \Delta_n$$

$$S' = \bar{\tau}(m;N) \cdot \sum_{n=1}^{N} \Delta_n$$

where m is any cycle corresponding to or occurring after the M^{th} cardiac cycle but before the N^{th} cycle ($M \leqq m < N$), where M is the cycle at which the maximum step concentration value Δ_M of tracer occurs, where N is a conveniently great number of cycles encompassing the measurement process and where 1 is the cardiac cycle corresponding to the first step of the tracer curve, where $\tau(1;N)$ is the mean cardiac period over N cardiac cycles

$$\left(\bar{\tau}(1;N) = \frac{1}{N} \cdot \sum_{n=1}^{N} \tau_n\right)$$

and $\tau(m;N)$ is the mean cardiac period over the $(N-(m-1))$ cardiac cycles

$$\left(\bar{\tau}(m;N) = \left(\frac{1}{N-(m-1)} \cdot \sum_{n=m}^{N} \tau_n\right)\right.$$

thereby determining the cardiac volumes are determined from the measured values (Δ_n, τ_n) and from the aforementioned relationships (S,S').

4,326,540

SYRINGE DEVICE WITH MEANS FOR SELECTIVELY ISOLATING A BLOOD SAMPLE AFTER REMOVAL OF CONTAMINATES

Donald L. Bailey, Thornton, Colo., and Charles Williams, Rolling Hills Estate, Calif., assignors to Marquest Medical Products, Inc., Englewood, Colo.

Filed Nov. 6, 1979, Ser. No. 91,393

Int. Cl.[3] A61B 5/14

U.S. Cl. 128—763 8 Claims

1. A syringe device for drawing blood samples comprising:

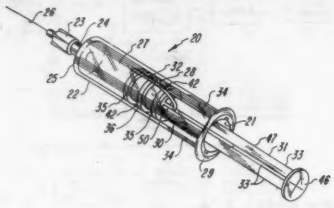
a tubular body having an interior surface defining an elongated interior chamber, said tubular body having one open end and an end member at the opposite end, said end member having a bore therethrough defining means for connection to a hypodermic needle;

a plunger slideably positioned within said tubular body, said plunger including an intermediate body portion extending out the open end of said tubular body and a resilient sealing member operatively connected to said intermediate

body capable of establishing an hermetic seal with said interior surface of said tubular body;

at least one flexible seal interrupter, said seal interrupter being generally linear and attached to said intermediate body adapted to interrupt said hermetic seal by being placed between said sealing member and the interior of said tubular body;

at least one longitudinal groove extending along the interior surface of the tubular body having a chamfer at the forwardmost end thereof and said groove being positioned along the slideable path of said seal interrupter so that said seal interrupter can be positioned in the groove without interrupting the seal between the sealing member and the interior surface of the tubular body; and



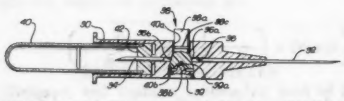
means for moving said seal interrupter into a position where it lies across and breaks the seal between the sealing member and said interior surface, and into a position wherein said seal is restored to prevent fluid flow past said sealing member.

4,326,541

BLOOD SAMPLE TAKING DEVICE

John F. Eckels, Simi, Calif., assignor to Arnold M. Heyman, Burbank, Calif.

Filed Mar. 24, 1980, Ser. No. 132,830
Int. Cl.³ A61B 5/14
U.S. Cl. 128—766 **4 Claims**



1. A blood sampling device for obtaining arterial and venous blood samples, said sampling device being configured for use with an evacuated tube of the type having a stopper at one end which is designed to be pierced by a needle, said device comprising:

a hub member having a longitudinal conduit, a normally closed valve located in the middle of the conduit for preventing blood flow therethrough, wherein the valve is made of a one piece resilient material, said alve being generally perpendicular to and passing through the conduit, said valve including a lower frusto-conical portion which is normally biased against the conduit to prevent blood flow therethrough and an upper cylindrical portion extending to the outer surface of the hub member, whereby when pressure is applied to the upper portion, it will cause the lower portion to compress and move away from the contact with the conduit, thereby permitting blood to flow around the valve and through the conduit, said hub member further including a cylindrical tube receiving portion at one end;

a front needle extending from one end of the conduit, said front needle being configured for insertion into a blood vessel of a patient; and

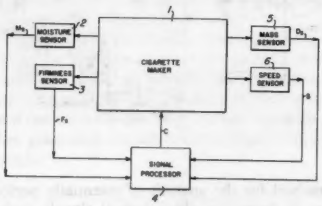
a rear needle extending from the other end of the conduit and into the tube receiving portion, whereby an evacuated tube can be inserted into the tube receiving portion and the stopper punctured by the rear needle prior to insertion of the front needle into a blood vessel without destroying the vacuum conditions of the tube.

4,326,542

FIRMNESS CONTROL IN A CIGARETTE MAKER

Tibor S. Laszlo, Arlington; John F. Nienow, Midlothian; John F. Sherwood, and Christopher L. Irving, both of Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Jan. 14, 1980, Ser. No. 111,607
Int. Cl.³ A24C 5/00, 5/34
U.S. Cl. 131—280 **28 Claims**



1. Apparatus for use with a cigarette rod, said apparatus including:

first sensor means for providing a firmness sensor signal corresponding to the firmness of said rod;

second sensor means for providing a moisture sensor signal related to the moisture in said rod;

signal processing means responsive to said firmness and moisture sensor signals comprising:

means for providing a corrected firmness signal deviating from said firmness signal by an amount related to said moisture in said rod; and

means for comparing said corrected firmness signal with a preselected firmness value to generate a comparison signal.

4,326,543

SMOKING PRODUCT AND PROCESS FOR MANUFACTURING SAME

Julian R. Martin, Winston-Salem, and Larry W. Sides, Welcome, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jun. 2, 1980, Ser. No. 155,876
Int. Cl.³ A24C 5/00, 5/56
U.S. Cl. 131—362 **10 Claims**

1. A smoking product comprising

(a) a generally cylindrical wrapped tobacco rod,

(b) a generally cylindrical non-wrapped fibrous filter having a cross-sectional dimension similar to said tobacco rod and in abutting, axial alignment with said tobacco rod, and

(c) tipping paper provided with a coating of hot-melt adhesive and surrounding substantially the entire length of the filter and one end of the abutting tobacco rod in contacting, sealing engagement wherein the coating of hot-melt adhesive covers at least 30 percent of the surface area on one side of the tipping paper as a result of the application of 10 to 60 grams of hot-melt adhesive per square meter of tipping paper in such a way that it gives a coating thickness of at least 8 microns and a combined tipping paper/-coating thickness of no more than 125 microns.

4,326,544
SMOKING PRODUCT

Michael J. Hardwick, Geneva, Switzerland, and Kenneth R. McMeekan, Whitehead, Northern Ireland, assignors to Gallaher Limited, Belfast, Northern Ireland

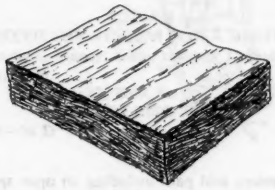
PCT No. PCT/GB79/00210, § 371 Date May 8, 1980, § 102(e) Date May 8, 1980, PCT Pub. No. WO80/01132, PCT Pub. Date Jun. 12, 1980

PCT Filed Dec. 11, 1979, Ser. No. 199,721

Claims priority, application United Kingdom, Dec. 11, 1978, 47896/78

Int. Cl.³ A24D *1/18*

U.S. Cl. 131—369 **11 Claims**



1. A method of making a tobacco substitute fuel smoking rod, said method comprising preparing viscose fibers in the form of a felt web in which the fibers have a three dimensional lay, a bulk density of between 5 and 80 kg/cu. m., and an areal density of between 0.15 and 1.0 kg/sq. m., subjecting said felt web to controlled pyrolysis until the organic residue contains at least 90% carbon by weight, loading the felt web with combustion modifying agents and volatile ingredients for smoking, dividing the felt web into strip pieces for smoking, and wrapping individual strip pieces in a tubular wrapper to form said smoking rods.

4,326,545
CURLING IRON

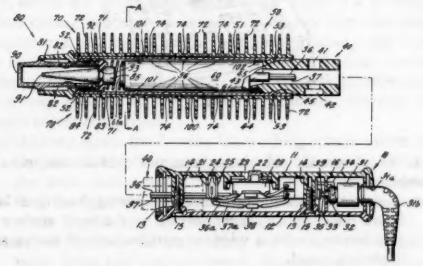
Akio Motegi, Kitamoto, and Takao Saitoh, Fukiage, both of Japan, assignors to Sanyei Corporation, Japan

Filed Jul. 23, 1979, Ser. No. 59,528

Claims priority, application Japan, Feb. 22, 1979, 54-022161

Int. Cl.³ A45D *1/02*

U.S. Cl. 132—33 R **11 Claims**



1. A hair curling iron, comprising

a heat conducting and transmitting cylinder; heating means in said heat cylinder for heating said heat cylinder; said heat cylinder being defined by an annular wall having a plurality of holes through it through which steam may pass;

steam producing means communicating into said heat cylinder for producing steam and for delivering steam into said heat cylinder for the steam to be emitted through said holes in said heat cylinder;

a plurality of heat non-conductive protrusions arrayed in a plurality of rows thereof said rows each extending longitudinally along said heat cylinder, and said rows being spaced apart annularly around said heat cylinder; said protrusions extending radially outwardly of said heat cylinder for enabling hair wound around said heat cylinder to be held against said heat cylinder and being so placed as to assist in preventing any undesired contact by the user of the curling iron with said heat cylinder;

each said row of protrusions comprises a supporting band and comprises a plurality of said protrusions spaced apart along and attached to said supporting band; means normally removably holding said supporting bands to said heat cylinder;

said holes in said heat cylinder are placed so as to be beneath said supporting bands; said supporting bands having holes therein for communicating with said holes in said heat cylinder to thereby provide exit pathways for steam from inside said heat cylinder through said holes in said heat cylinder and through said holes in said supporting bands.

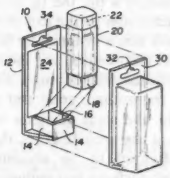
4,326,546
COMBINATION LIPSTICK DISPLAY AND STORAGE CONTAINER

Stanley Acker, c/o 14 Cairngorm Rd., New City, N.Y. 10956

Filed Nov. 28, 1980, Ser. No. 211,193

Int. Cl.³ A45D *40/00*; B65D *85/72*

U.S. Cl. 132—79 C **3 Claims**



1. A combination lipstick display and storage container comprising a panel that is vertically oriented during display service of said container, a cooperating arrangement of walls extending laterally from the base of said panel bounding a sized compartment providing a friction fit with a lipstick projected therein, and a rectangular mirror mounted lengthwise on said panel behind said lipstick to contribute to providing an enhanced appearance thereto during display service of said container, and whereby said mirror following removal subsequently of said lipstick and upon being oriented horizontally also contributes to facilitating the application of said lipstick on the lips of the user by the image reflected thereon.

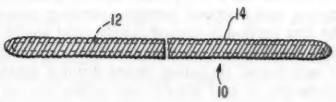
4,326,547
TOOTH PROBE DEVICE

C. Michael Verplank, P.O. Box 564, Crested Butte, Colo. 81224

Filed Nov. 3, 1980, Ser. No. 203,250

Int. Cl.³ A61C *15/00*

U.S. Cl. 132—89 **8 Claims**



1. A dental probe comprising:

an unsupported thin core strand having a generally uniform

cross-section of a material which is stiff and flexible but returns to substantially its original shape when not stressed; and an outer sheath surrounding said core strand made of a material suitable for engaging teeth and gums.

4,326,548

PERSONAL ORAL HYGIENE TOOL

Eugene C. Wagner, 3424 Kingsbridge Ave., Bronx, N.Y. 10463

Filed Jun. 9, 1980, Ser. No. 157,442

Int. Cl.³ A61C *15/00*

U.S. Cl. 132—90 **5 Claims**

1. A dental tool for personal oral hygiene comprising a pick, the pick having a stem and an arcuate zone projecting from the stem and terminating at a tip, the tip extending along a plane substantially perpendicular to the axis of the stem and projecting beyond the stem axis a distance up to but not significantly greater than three millimeters, the pick being formed of a resilient material, the material having a diameter in the order of one millimeter at the arcuate zone and tapering to a smaller diameter at the tip, the stem diameter being larger than the material diameter at the arcuate zone, the arcuate zone being anatomically configured to be accommodatingly received around curved tooth surfaces and including a longitudinal span of between substantially ten to fifteen millimeters, the tip passing between interproximal spaces formed between adjacent teeth in the user's mouth with the pick contoured to avoid interference with adjacent teeth to thereby efficaciously remove materials lodged in such interproximal spaces, the tool further including an elongate cylindrical holder, means securing the pick at one end of the holder and a cap, the cap selectively covering the pick when not in use, the holder and the cap being configured in simulation of a writing implement whereby the tool may be inconspicuously carried about.

4,326,549

DENTAL HYGIENE APPLIANCE

John H. Hinding, 1140 S. Robert St., West St. Paul, Minn. 55118

Filed Aug. 18, 1980, Ser. No. 178,947

Int. Cl.³ A61C *15/00*

U.S. Cl. 132—92 R **9 Claims**

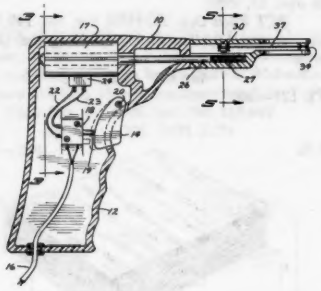
1. A device for applying and moving a closed loop of dental floss between the teeth, comprising:

A. a closed loop of dental floss;

B. a frame having a first portion including handle grip and a trigger, and a second portion extending outwardly from the first portion at approximately right angles thereto;

C. motor and drive train means mounted in said first portion of said frame, including motor control means operably connected to said trigger and power source means for supplying power to said motor to rotate the drive train means, said drive train means including a drive shaft extending outwardly from said first portion and into said second portion of said frame, said drive shaft including a worm gear at its outer end; and

D. guide means including a drive wheel and a plurality of guide pulleys positioned in said second portion of said frame to define a path for said closed loop of dental floss



under tension, said path including an open span sized to permit passage of said floss between a person's teeth, said drive wheel including a spur gear positioned to engage said drive shaft worm gear to cause rotation of said drive wheel by said motor.

4,326,550

CONSTRUCTION OF CHANGE HOLDER FOR USE IN ELECTRONIC CALCULATING MACHINE

Daisuke Mochizuki, Nara, and Toshio Sugitani, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 21, 1979, Ser. No. 96,401

Claims priority, application Japan, Nov. 21, 1978, 53-161279[U]; Nov. 27, 1978, 53-163511[U]; Dec. 6, 1978, 53-151237; Dec. 6, 1978, 53-151238; Dec. 8, 1978, 53-152340; Dec. 11, 1978, 53-170485[U]; May 28, 1979, 54-72011; Jul. 4, 1979, 54-92621

Int. Cl.³ G07D *1/08*

U.S. Cl. 133—2 **6 Claims**

1. An electronic calculating machine which comprises in combination:

an electronic calculating machine housing having a keyboard panel and a saucer formed in the front surface of said housing with a window portion located above said keyboard panel,

a coin holder adapted with a plurality of coin shelves and corresponding reflection plates with associated railway plate and multiple pathways for directing coins ejected from said coin shelves by forwarding members positioned behind said coin shelves into said saucer, said forwarding members being activated by a control unit contained in the body of said coin holder, said coin holder further including a transparent window, said coin holder being retrofitted into the housing of said electronic calculating machine such that said transparent window of said coin holder is

positioned above said keyboard panel immediately behind the window portion of said electronic calculating machine housing such that a certain number of coins stored in the coin shelves of said change holder are visible from the outside of said electronic calculating machine, and

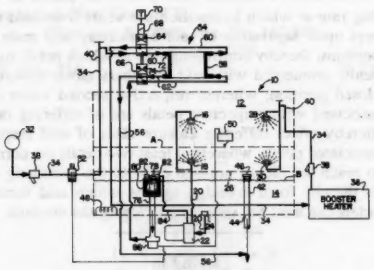
a kit for retaining operating key units secured on the face of the housing between the saucer and the plurality of coin-shelves.

4,326,551

HEAT RECOVERY SYSTEM FOR A DISHWASHER

John E. Voorhees, Sidney, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Oct. 27, 1980, Ser. No. 200,857
Int. Cl.[3] B08B 3/02
U.S. Cl. 134—58 D 12 Claims



1. A dishwasher of the type having a wash chamber with a sump at its bottom for containing a quantity of washing solution, means for maintaining the washing solution in the sump at a relatively high washing temperature, means for spraying the washing solution over soiled articles supported in the wash chamber, means for circulating the solution from the sump to the washing solution spraying means, a drain line for the washing solution, a pressurized source of fresh rinsing water at an initial temperature substantially below said washing temperature, means for heating the fresh rinsing water to a predetermined rinsing temperature substantially higher than said initial temperature, and means for receiving fresh rinsing water from the rinsing water heating means and spraying the fresh rinsing water at said rinsing temperature over the articles after they have been sprayed with the washing solution, wherein the improvement comprises:

preheating means for flowing the washing solution from the sump in heat exchange relation with, but separated from, the fresh rinsing water before the rinsing water reaches the rinsing water heating means such that the rinsing water is preheated by the washing solution;

rinse valve means for controlling the flow of fresh rinsing water from said source thereof, through said preheating means and to the rinsing water spraying means;

pump means for pumping washing solution from the wash chamber, through said preheating means and then finally to said drain line after heat exchange with the fresh rinsing water; and

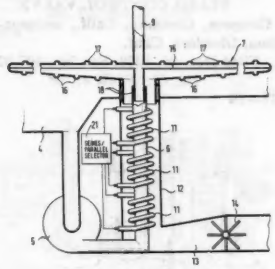
control means for energizing said pump means and energizing said rinse valve means such that rinsing water and washing solution flow through said preheating means during spraying of articles with the rinsing water.

4,326,552

HEATER FOR HEATING FLOWS OF FLUID AND DISHWASHING MACHINE PROVIDED THEREWITH

Ingo Bleckmann, Ignaz-Rieder-Kai 11, A-5020 Salzburg, Austria

Filed Jan. 22, 1980, Ser. No. 114,395
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1979, 7901761[U]; European Pat. Off., Jul. 18, 1979, 79102505.9
Int. Cl.[3] B08B 3/02
U.S. Cl. 134—99 14 Claims



1. A dishwashing machine comprising:

a vessel adapted to receive items to be washed and dried;

a first flow conduit for carrying a flow of dish-washing liquid to said vessel;

a second flow conduit for carrying a flow of drying air for drying items in said vessel; and

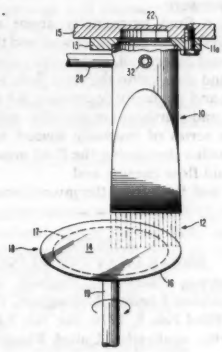
a heating means operatively associated with said first and second flow conduits, for heating the washing liquid flowing through the first flow conduit during a washing operation and for heating the flow of drying air through the second conduit during a drying operation.

4,326,553

MEGASONIC JET CLEANER APPARATUS

William B. Hall, Dallas, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 28, 1980, Ser. No. 181,985
Int. Cl.[3] B08B 3/00
U.S. Cl. 134—153 4 Claims



1. An apparatus for cleaning a surface of an article with cleaning fluid comprising:

nozzle means incluing a nozzle and a chamber for developing a jet of cleaning fluid; said chamber formed of a generally hollow cylinder having two open ends; means for coupling pressurized fluid at a pressure of about 20 psi to the chamber; and an electrically energized megasonic

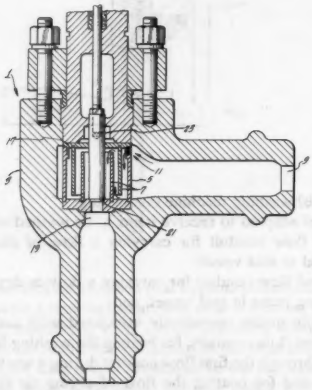
transducer coupled to one end of the chamber to impart megasonic energy to the fluid, said nozzle coupled to the other end of said chamber and formed of a tapered section to an opening to develop a ribbon-like jet of cleaning fluid vibrating at ultrasonic frequencies the taper of said nozzle being at an angle of about 30° to reduce out-of-phase and back reflections of energy waves in the nozzle.

4,326,554

FLUID CONTROL VALVE

Calvin A. Gongwer, Glendora, Calif., assignor to Innerspace Corporation, Glendora, Calif.

Filed Dec. 26, 1979, Ser. No. 107,026
Int. Cl.³ F16K *47/08*
U.S. Cl. 137—14 **14 Claims**



7. A method of fluid control comprising:

regulating the amount of said fluid entering a housing means providing an axially extending outer wall and inner walls in inwardly spaced concentric annular relation, said annular walls having gradually decreasing diameters;

dissipating a significant portion of fluid flow energy of said fluid by overcoming a preload of a preload member of a valve nozzle means;

closing said valve nozzle means below a preselected incoming fluid pressure;

accelerating a fluid tangentially about an annular whirl chamber defined by said outer wall and the inner wall next adjacent said outer wall, and thereby decreasing the fluid pressure and dissipating the fluid flow energy;

accelerating and gradually decreasing the annular flow path diameter and further tangentially spinning said fluid through a series of inwardly spaced concentric annuli, thereby further decreasing the fluid pressure and dissipating the fluid flow energy; and

discharging said fluid from the inwardmost annulus.

4,326,555

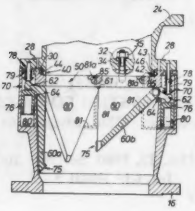
BREAKAWAY COUPLING

John G. Thomson, Sherwood, England, assignor to Gall Thomson Maritime Limited, Nottingham, England

Filed Feb. 5, 1979, Ser. No. 9,447
Claims priority, application United Kingdom, Feb. 4, 1978, 4565/78
Int. Cl.³ F16K *13/04*
U.S. Cl. 137—68 R **4 Claims**

1. In a breakaway pipe coupling having a body through which extends a conduit, said body having a breakaway portion and a main body portion, said main body portion including first valve means for closing the conduit, actuating means for closing said first valve means to close the conduit upon separation of said breakaway portion from said main body portion and damping means for controlling rate at which said first valve means closes, the improvement wherein:

said first valve means includes petals circumferentially spaced about the conduit, said petals defining a conical shape when in a closed position, the apex of said conical shape facing in the direction opposite the fluid flow direction through the conduit; wherein said damping means includes hydraulic pistons and chambers hydraulically asssociated with said plurality of petals and second valve means associated with said hydraulic pistons for control-



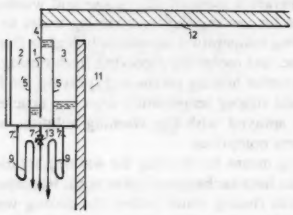
ling rate at which hydraulic fluid vents from said chambers upon separation of said breakaway and main body portions, thereby controlling rate at which petals hydraulically connected with said chambers move towards the closed position; wherein respective second valve means associaed with respective petals are of differing rate, to thereby effect differing closure rates of said respective associated petals, wherein at least two petals are permitted to reach the closed position prior to the remaining petals to thereby form a bridge against which said remaining petals can abut for support on closing the conduit.

4,326,556

APPARATUS FOR SEALING THE PERIPHERY OF AN OPENING

Hans Deutsch, and Norbert Heger, both of Vienna, Austria, assignors to Waagner-Biro Aktiengesellschaft, Vienna, Austria

Filed Mar. 7, 1980, Ser. No. 129,014
Claims priority, application Austria, Mar. 8, 1979, 1731/79
Int. Cl.³ F16K *9/00*; B08B *3/02*
U.S. Cl. 137—240 **10 Claims**



1. In apparatus for peripherally sealing openings such, for example, as openings for feeding coke material into a bin, in a shaft for cooling hot bulk material, or a shaft in a blast furnace, wherein a channel having inner and outer sides is provided extending around the periphery of said opening into which a dividing wall extends whose lower end is spaced from the channel bottom so as to define a pair of adjacent channel portions which intercommunicate through the space between the lower end of the dividing wall and the channel bottom, said channel adapted to contain a liquid at least to an extent whereby said space is filled with the liquid, the improvement comprising:

a pair of external channels, each of said external channels extending around a respective one of the inner and outer sides of said peripherally extending channel directly adjacent thereto, so that the latter comprises an inner channel;

first and second intermediate walls being defined by the inner and outer sides of said inner channel and separating said pair of external channels from said inner channel, respectively;

a liquid inlet communicating with said inner channel; and

liquid outlets communicating with said external channels;

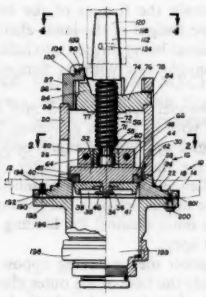
whereby a liquid can be continuously supplied into said inner channel in a manner such that the liquid can continuously overflow over at least one of said intermediate walls into a respective one of said external channels from which liquid can then be removed in order to facilitate cleaning of said inner channel as well as effecting a liquid seal for said opening.

4,326,557

TOP OPERATED TANK CAR BOTTOM OUTLET VALVE ASSEMBLY INSTALLED FROM THE BOTTOM OF THE CAR

Gunter R. Behle, St. Peters, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Apr. 21, 1980, Ser. No. 142,309
Int. Cl.³ F16K *31/50*
U.S. Cl. 137—316 **25 Claims**



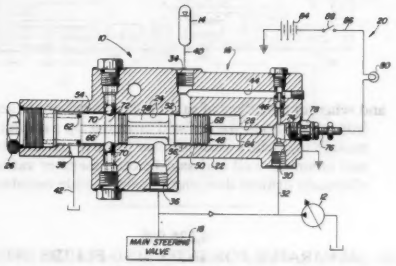
1. A top operated tank bottom outlet valve assembly which can be installed from the bottom of the tank comprising: a tank having a bottom opening; a tank mounting flange located within said bottom opening and having a mounting flange opening; a generally vertical extending valve cage extending into said tank through said mounting flange opening and having a horizontal cross section throughout its extent into the tank of smaller dimensions than said mounting flange opening; said cage having spaced openings for lading flow into the cage; a cage mounting flange extending outwardly from said cage; a valve seat located within said cage; a vertically extending threaded valve stem located within said cage; closure fastening means attaching a valve closure to a lower portion of the stem; said valve closure and said valve stem located within said cage with said closure resting on said valve seat; threaded sleeve means connected to said stem and extending outwardly toward and engaging said cage; removable keeper means retaining said sleeve means in engagement with said cage and preventing said sleeve from rotating during rotation of said stem; said stem connected to top operating rod means extending upwardly to the top of the tank whereby said valve assembly may be raised from below said tank until said cage mounting flange engages said tank mounting flange; removable valve assembly fastening means attachable from the bottom maintaining said cage mounting flange in engagement with said tank mounting flange and holding said cage in place within the tank; said cage, said closure, said valve stem, said sleeve means and said keeper being removable from the bottom by removal of said valve assembly fastening means.

4,326,558

STEERING SYSTEM INCLUDING ACCUMULATOR FOR SUPPLYING EMERGENCY RESERVE OF FLUID

Douglas M. Gage, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Nov. 24, 1980, Ser. No. 209,763
Int. Cl.³ B62D *5/08*
U.S. Cl. 137—554 **5 Claims**



1. In an emergency steering valve including a valve bore intersected by first and second ports respectively adapted for connection to an accumulator and to a main power steering valve, a pressure-responsive valve spool reciprocably mounted in the bore for movement between a closed position wherein it blocks fluid communication between the first and second ports and an open position wherein it establishes fluid communication between the first and second ports, pilot pressure means adapted for connection to a primary source of fluid pressure and arranged for shifting the valve spool to its closed position when the fluid pressure emanating from the primary source is adequate for normal steering operation, a biasing means arranged for shifting the valve spool to its open position when the primary source of fluid pressure fails and an electrical steering condition indicator circuit including an energizable indicator element and a pressure switch means operable for completing a circuit through the indicator element only when the valve spool is shifted away from its closed position, the improvement comprising: said pressure switch means including means operated by the valve spool for completing the circuit through the indicator element only when the valve spool reaches its open position and delay means for regulating the speed of travel of the valve spool from its closed to its open position for preventing premature actuation of the indicator element in response to primary fluid pressure decreases of short duration.

4,326,559

FLUIDIC FORCE TRANSDUCER

Tadeusz M. Drzewiecki, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 25, 1980, Ser. No. 143,698
Int. Cl.³ F15C *3/08*
U.S. Cl. 137—804 **10 Claims**

1. A fluidic force transducer comprising:

a plurality of parallel stacked layers joined to form a transducer;

a nozzle for issuing a fluid stream;

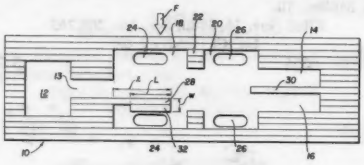
a first and second outlet means symmetrical about the centerline of said nozzle for receiving fluid from said nozzle;

a chamber symmetrical about said centerline of said nozzle interconnecting said nozzle and said first and second outlet means;

a flexible member extending from said nozzle into said cham-

ber parallel to the axis of said nozzle defining a barrier in said chamber which is responsive to forces transverse said nozzle axis to vary the portions of fluid received by said first and second outlet means;

one of said stacked layers which forms one wall of said nozzle includes said flexible member as an extension of said wall.



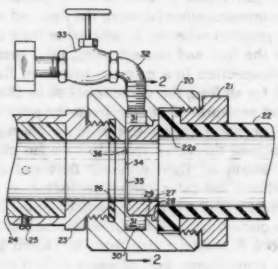
and wherein the edges of said flexible member are separated from at least one wall of said chamber by a distance small enough to create a viscous shear force of the fluid between said chamber wall and said flexible member sufficient to effectuate critical damping of said flexible member.

4,326,560

APPARATUS FOR INJECTING FLUIDS INTO AGGREGATES

William A. Drudy, Macungie, Pa., assignor to R.F.I. Inc., Farmingdale, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,057
Int. Cl.³ F16K *19/00*
U.S. Cl. 137—897 **1 Claim**



1. Apparatus for mixing a flowing aggregate with a fluid and discharging the mixture to a target for curing and hardening, the apparatus comprising a fluid body adapted to be connected at one end to an aggregate conveying hose and connected at its other end to a discharge nozzle and including

wall means defining an internal annular fluid manifold adapted to be connected to a source of fluid under pressure;

wall means defining an axial bore of substantially the same size as the inside diameter of the hose and coaxial therewith and an annular wall perpendicular to the axis of the bore and extending from the manifold to the edge of the axial bore;

a fluid metering ring seated in the fluid body having an axial bore of the same size and aligned with the axial bore of the fluid body and having an annular surface perpendicular to the axis of flow spaced from and parallel to the perpendicular annular wall of the fluid body to define a fluid metering slot surrounding the flow of aggregate and connected to the fluid manifold;

an annular spacing rib on the outer surface of the fluid ring and extending radially outward therefrom;

a radially inwardly projecting rib carried by the fluid body having a surface perpendicular to the flow of aggregate and adapted to be engaged by an opposed surface on the rib of the fluid ring, the positions of the two opposing rib surfaces with respect to the annular wall being precisely determined to determine the width of the annular slot conveying fluid from the manifold into the aggregate; and

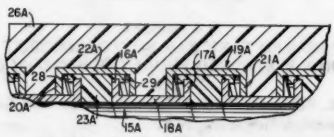
means to attach the nozzle to the fluid body to bring the inner end of the nozzle into engagement with the forward edge of the fluid ring to bring the opposing surfaces of the ribs into tight engagement.

4,326,561

DOUBLE-CHANNEL ELECTRICAL CONDUIT

Thomas A. Kutnyak, Greenwood, S.C., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Jun. 4, 1980, Ser. No. 156,456
Int. Cl.³ F16L *11/16*
U.S. Cl. 138—136 **3 Claims**



1. An electrical conduit comprising

(a) an inner channel and an outer channel each having forward and rearward side flanges joined by a connecting base and wherein the flanges of the outer channel are longer than the flanges of the inner channel,

(b) the inner channel being formed into helical configuration of spaced convolutions with its flanges extending outwardly,

(c) the outer channel being formed into a similar helical configuration with its flanges extending inwardly,

(d) the helical inner and outer channels being movably interlocked with the flanges of the outer channel disposed between the flanges of the inner channel,

(e) elastic spacer means between the forward and rearward flanges of the inner channel for holding the turns of the inner channel apart,

(f) the elastic spacer means having opposed edge portions extending inside the base of the outer channel and around and over each of the forward and rearward flanges of the inner channel for holding the forward flange of the outer channel a minimum distance from the rearward flange of the inner channel and for holding the forward flange of the inner channel a minimum distance from the rearward flange of the outer channel, and

(g) an outer circumferentially complete jacket,

(h) whereby when the conduit is bent the channel convolutions separate on the outside of the bend and come together on the inside of the bend.

4,326,562

DOBBIES FOR FORMING THE SHED ON WEAVING LOOMS

Joseph Palau, Duingt, France, assignor to S.A. des Etablissements Staubli (France), Fauerges, France

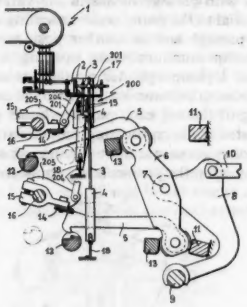
Filed Dec. 27, 1979, Ser. No. 108,244
Claims priority, application France, Feb. 13, 1979, 79 04463
Int. Cl.³ D03C *1/26, 1/06*
U.S. Cl. 139—68 **1 Claim**

1. In a dobby for controlling the shed of a weaving loom, the dobby being of the type having multiple double swinging levers coupled respectively to loom heddle frames, the levers being displaceable by associated pulling hooks respectively located adjacent to pulling knives, each pulling hook being displaceable downwardly for coupling with a pulling knife by a lowering knife and being displaceable upwardly away from the pulling knife by a stirrup whose upward displacement is

under the control of a reading mechanism, the improvement comprising:

(a) a pair of vertical slide means;

(b) a connecting rod coupling each slide means with a lowering knife to raise and lower the slide means synchronously therewith;



(c) raising knife means carried by, and operative to be raised and lowered by each slide means;

(d) a gripper coupled with each stirrup and located adjacent to a raising knife; and

(e) means under the control of the reading mechanism for selectively moving the gripper into or out of contact with a raising knife.

4,326,563

CONTROL FOR A DOBBY MECHANISM

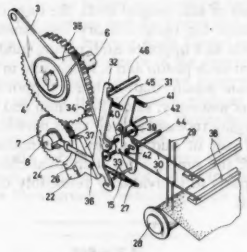
Josef Brock, Viersen, and Paul Surkamp, Krefeld, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Carl Zangs Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

Filed Sep. 21, 1979, Ser. No. 77,866

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 2841281

Int. Cl.³ D03C *1/12*

U.S. Cl. 139—76 **10 Claims**



1. In a control for a wedge coupling in a dobby mechanism with a reduction gearing between a drive shaft and an eccentric device for the dobby movement, a coupling place, and a spring-tensioned switching member, controlled according to a pattern, for the movement of the wedge, the improvement comprising

two spring-tensioned control levers for the upper and lower shed movement, said control levers operatively engage the switching member,

needle means for controlling said control levers,

control axle means for being synchronously movable with the dobby mechanism,

one of said control levers additionally cooperates with said control axle means,

a pulse means is synchronously controlled by the eccentric device, said pulse means for blocking a control end of a not to be moved of said control levers in a starting position thereof.

4,326,564

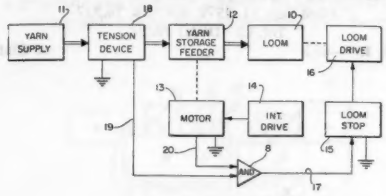
LOOM STOP MOTION SYSTEM AND METHOD

Manuel G. Teixeira, Cumberland, and Rene J. Valois, Woonsocket, both of R.I., assignors to Lessona Corporation, Warwick, R.I.

Filed Jan. 31, 1980, Ser. No. 117,380

Int. Cl.³ D03D *51/34*

U.S. Cl. 139—370.2 **4 Claims**



1. A loom control system operable to stop the loom in the presence of slack or breakage of a supply yarn comprising in combination; a yarn supply system feeding yarn in a supply path to a loom through intermediate yarn feeder means driven intermittently by a motor in response to the need to feed the yarn intermittently to the loom, a control circuit for stopping the loom, means sensing a slack or broken condition of said yarn in the supply path, means sensing the intermittent drive to said motor including an electronic circuit coupled across the motor, a control relay driven by an amplifier device, and means actuating said amplifier device to operate said control relay in the concurrent presence of slack or breakage of the yarn in the supply path and drive to said motor to stop the loom.

4,326,565

APPARATUS FOR INSERTING SUCCESSIVE WEFT YARN LENGTHS IN A SHUTTLELESS WEAVING MACHINE

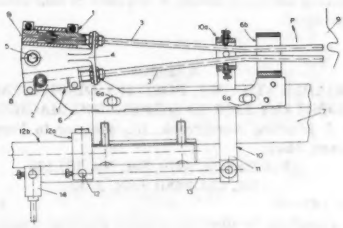
Hubert P. Van Mullekom, Voortseweg 11, Deurne, Netherlands

Filed Mar. 27, 1980, Ser. No. 134,649

Claims priority, application Netherlands, Apr. 25, 1979, 7903273

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—435 **5 Claims**



1. Apparatus for inserting successive weft yarn lengths in a shuttleless weaving machine, which comprises at least two blowing nozzles each comprising a body having inlet apertures for the yarn and for a transport fluid, and each having a mixing tube joined therewith for guiding the yarn and transport fluid enclosing the yarn, arranged at one side of said weaving machine opposite to one end of a weaving shed, characterized in

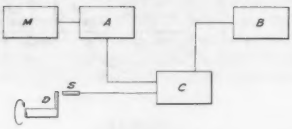
that the blowing nozzles are jointly mounted to pivot around a fixed point located between the bodies of the blowing nozzles, the outlet ends of the mixing tubes being closely adjacent and being arranged to be brought alternatively into operative inserting position relative to said shed by such pivoting of the blowing nozzles, and an element for controlling such pivoting, which engages the mixing tubes at a point between the nozzle bodies and the outlet ends of the mixing tubes.

4,326,566

COLOR SELECTOR

Roger R. Lampaert, Ypres, Belgium, assignor to N. V. Weefautomaten Picanol, Ypres, Belgium

Filed Sep. 11, 1979, Ser. No. 74,337
Int. Cl.³ D03D *47/38*
U.S. Cl. 139—453 **10 Claims**



1. A weft thread colour selector for a loom including a weaving pattern control (M), a weft thread giver (B) for multiple weft thread colour and a shaft (**16**) rotatable in synchronism with the loom drive shaft, comprising:

a colour selector (A) including means (**2**) for receiving mechanical input movement under control of said weaving pattern control, said input movement corresponding to a weft thread colour selection;

said colour selector including electrical colour selection signal generating switches (**3**) arranged to be selectively activated by said input movement receiving means;

a synchronizing device (c) electrically connected to said colour selector and arranged to receiving electrical colour selection signals from said colour selector and to temporarily store said signals;

a synchronizing signal generator (D,S) including an element (D) moveable in synchronization with the loom drive shaft for generating an electrical synchronizing signal;

said synchronizing device electrically connected to said synchronizing signal generator and arranged to receive synchronizing signals generated by same, and to transmit a stored colour selection signal only when it receives a synchronizing signal;

said weft thread giver being electrically connected to said synchronizing device and including an electrically operated control means (**24**) arranged to receive said colour selection signal and to cause the weft giver to present a selected coloured thread in response to said colour selection signal.

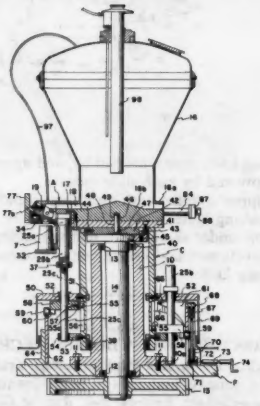
4,326,567

VARIABLE VOLUME, POSITIVE DISPLACEMENT SANITARY LIQUID DISPENSING MACHINE

Robert J. Mistarz, Northbrook, Ill., assignor to Vercon Inc., Coleman, Mich.

Filed Dec. 26, 1979, Ser. No. 107,324
Int. Cl.³ B65B *3/04, 3/32*
U.S. Cl. 141—90 **15 Claims**

1. In a machine for dispensing liquid and semi-liquid material and the like in measured amounts to containers and having a supply tank with a plurality of circumferentially spaced radial tank outlet openings; a carrier for supporting a multiplicity of containers with open upper ends mounted for lateral orbiting movement with said tank; a filler pump and valve assembly, mounted to orbit with the carrier, and connected with said tank, the assembly having a plurality of passages communicating with the tank outlet openings, the assembly also having a plurality of separate pump communicating passages, and a plurality of separate dispensing openings disposed above the path of movement of the carrier and the containers thereon; the said passages being arranged in radially aligned sets, each having a tank outlet passage, a pump communicating passage, and a dispensing opening; said assembly also including a valve for each set with passage means in the valve in one position feeding material to the pump communicating opening from the tank outlet passage and in another position feeding material from the pump communicating opening to the dispensing opening; and a pump cylinder portion on said assembly for each passage set in communication with the pump communication opening of the set; each pump cylinder portion having a piston mounted for reciprocating movement in a suction and ejection stroke; arcuate cam track means about which the pump pistons orbit, the pistons being connected with followers



moved by the cam track means to provide the stroke of the pistons and determine the amount of material moved by a pump piston out the dispensing opening of each set; the improvement wherein said frame has a sleeve, internally journaling a central shaft and externally journaling a cage hung from the upper part of said central shaft, the cage externally mounting the pistons for reciprocatory movement vertically and having a guide slot opposite each piston; guide means projects laterally from each piston and is receivable in one of said guide slots to prevent piston rotation; brace supports project radially from the tank assembly; said filler pump and valve assemblies have converging recesses at their sides permitting their suspension from a pair of said supports in a manner to be liftable vertically off the supports for individual cleaning; and means on said supports to individually releasably clamp said assemblies in place.

4,326,568

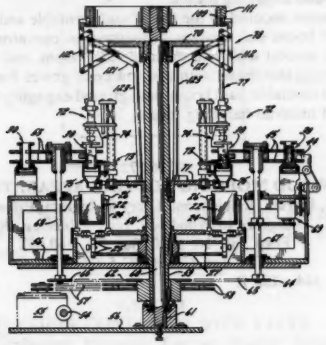
PACKAGING MACHINE WITH CONTINUOUS MOTION FILLER

Charles A. Burton, and Robert C. Russell, both of Columbus, Ohio, assignors to Rexham Corporation, New York, N.Y.

Filed Feb. 7, 1980, Ser. No. 119,309
Int. Cl.³ B65B *3/12*
U.S. Cl. 141—114 **12 Claims**

11. A machine for depositing product into upright flexible pouches adapted to be advanced continuously and in equally spaced relation around an arcuate path, said machine comprising a turret having a series of holders located above said path and spaced arcuately from one another in accordance with the spacing of the pouches, mechanism for rotating said turret continuously about an upright axis which coincides with the center of said path, a series of angularly spaced funnels carried by said turret and positioned to register with said pouches as

the pouches are advanced around said path, each of said funnels being mounted on said turret to move between raised and lowered positions, the lower end of each funnel being disposed above the underlying pouch when the funnel is in its raised position and being disposed within the pouch when the funnel is in its lowered position, a series of angularly spaced plungers carried by said turret and alined vertically with said funnels, each of said plungers being mounted to move vertically between inactive and active positions, the lower end of each plunger being located above the upper end of the underlying funnel when the plunger is in its inactive position and being located adjacent the lower end of the funnel when the plunger is in its active position, a series of containers adapted to hold said product, each of said containers comprising upper and lower sleeves telescoped slidably together, a gate pivotally mounted on the lower end of said lower sleeve and normally closing the lower end of said upper sleeve to retain the product



in the container, the lower end of said upper sleeve engaging and opening said gate when said upper sleeve is slid downwardly within said lower sleeve, means for delivering filled containers to said holders, each container being delivered to its respective holder when the associated plunger is in its inactive position and when the associated funnel is in its raised position and being delivered to the holder in a position located between the lower end of the plunger and the upper end of the funnel, means on said turret for moving each funnel to its lowered position, for sliding the upper sleeve of the overlying container downwardly relative to the lower sleeve thereof and into the funnel, and for moving the associated plunger to its active position, said last-mentioned means thereafter raising said plunger to said inactive position, sliding the upper sleeve of the container upwardly relative to the lower sleeve thereof and out of said funnel, and moving said funnel to said raised position, and means for thereafter removing each container from its holder.

4,326,569

STOPCOCK SEAL

Vincent L. Vaillancourt, Livingston, N.J., assignor to Critikon, Inc., Tampa, Fla.

Filed Feb. 15, 1980, Ser. No. 121,848
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—383 **12 Claims**

7. A unitary seal for a side arm lumen of a stopcock comprising;

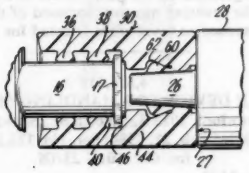
a generally cylindrical body having a first end and having an opening extending from said first end into said body, said opening adapted for receiving a stopcock said arm, and said body having a second end adapted to receive the nose of a syringe;

a plurality of spaced-apart sealing rings extending substantially radially from said body into said opening and adapted to provide sealing engagement with said stopcock side arm by deforming against said stopcock side arm when it is inserted into said opening;

a substantially annular recess in said body disposed adjacent said innermost sealing ring to accommodate a Luer lock fitting that may exist on the end of a stopcock side arm;

a spacer disposed between said annular recess and said second end and extending radially from said body into said opening and having a first surface against which said stopcock side arm bottoms, said spacer extending a predetermined axial distance from said first surface toward said second end, said spacer adapted to prevent said syringe nose from bottoming on said stopcock side arm;

a penetrable cap integrally disposed on said second end and closing said opening, said cap including a slit therethrough



for facilitating penetration by the nose of the syringe through said cap into fluid communication with said opening, said resilient material adapted to provide sealing engagement between said cap and said syringe nose;

a recess in the outer surface of said cap about said slit for guiding said syringe into said slit;

an additional quantity of material on the inside surface of said cap disposed as a convex dome projecting into said opening to provide additional sealing contact between said cap and said syringe nose; and,

a second recess in said body adjacent said penetrable cap for receiving the cap material displaced when said syringe nose penetrates said cap thereby facilitating easy insertion of said nose into said opening.

4,326,570

TREE PLANTATION SELECTIVE FALLING AND STOCKING CONTROL DEVICE

Robert B. Fridley, Federal Way, Wash., and Raymond L. Moser, Hot Springs, Ark., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Sep. 10, 1979, Ser. No. 73,975
Int. Cl.³ A01G *23/08*
U.S. Cl. 144—34 R **59 Claims**

1. Apparatus for selectively cutting trees on tree plantations, said apparatus being propelled by a prime mover and comprising:

a. a rigid frame supporting an operating assembly which further comprises;

b. a moveable arm pivotally mounted to the frame, said arm including;

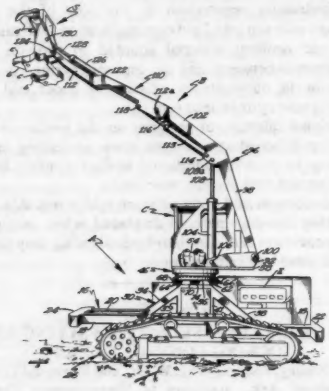
(1) positioning means to permit relative movement of the arm from an idling position relatively nearer the longitudinal axis of the prime mover to an operating position relatively outboard of the longitudinal axis,
(2) biasing means exerting a forward force on the arm while in the operating position, and
(3) guide means at the distal end of the arm to direct the arm past trees selected to remain standing by causing the arm to move back toward the idling position against the biasing means when such trees are contacted during forward movement of the prime mover;
c. deployable tree-severing means mounted at the distal end of the arm; and
d. deploying means operating between the arm and severing means, said deploying means serving to advance the severing means from a neutral position where said severing means is guarded by the guide means to a cutting position where the severing means is forward of the guide means and is exposed to sever trees selected for removal.

4,326,571

MOBILE DEVICE FOR HANDLING MATERIAL

Patrick J. Crawford, 1013 S. Lincoln St., Shawano, Wis. 54166

Filed Feb. 21, 1980, Ser. No. 123,270
Int. Cl.³ A01G *23/08*
U.S. Cl. 144—34 E **4 Claims**



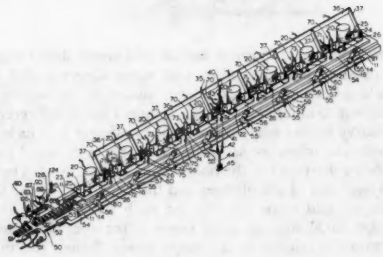
1. A mobile device for handling material comprising:
(a) a frame including elongated first and second spaced side members,
(b) ground engaging means mounted on each side of said side members for providing mobility to said frame,
(c) first and second side mounts secured substantially centrally of and extending upwardly of said first and second frame side members, respectively,
(d) a turntable pivotally connected to and centrally of the upper extend of said side mounts for pivotal movement transversely of and above said frame,
(e) means connected to said frame and said turntable for pivoting said turntable,
(f) a source of power mounted on said frame centrally transversely thereof and in a plane below that of said turntable,
(g) means carried by said turntable for rotation of said turntable throughout 360°,
(h) a boom having an inner portion pivotally connected to an outer portion,
(i) material handling means mounted on the outer end of said boom,
(j) a support secured at its inner end to the top of said turntable substantially on a diameter of said turntable, and parallelly disposed relative to said frame with the outer end of the support extending to a point outwardly of and offset from said turntable but within the extent of the width of the ground engaging means when the turntable is rotated,
(k) the inner end of said inner boom portion pivotally connected to the outer end of said support with said boom overlying said turntable on substantially a diameter of said turntable with said material handling means oppositely disposed to said support,
(l) a ram having its lower end pivotally connected to said turntable at a point offset from the axis of the turntable and intermediate the axis of the turntable and the pivotal connection of the inner end of the boom to the support and in alignment with the inner end of said boom with the upper end of the ram connected to said boom, whereby the boom may be pivotally raised and lowered over the turntable and when fully lowered, the inner and outer portions of the boom and the material handling means extend within the horizontal transverse extend of the ground engaging means,
(m) means secured to the top of said turntable and alongside said boom and ram for supporting an operator rotatable and pivotal with said turntable and boom, and
(n) means associated with said source of power for actuating said turntable, said boom, said ground engaging means and said material handling means.

4,326,572

WOOD MOLDING ROUTING APPARATUS

Harry T. Ingram, Raleigh, and Larry R. Ingram, Princeton, both of N.C., assignors to Woodtech, Inc., Princeton, N.C.

Filed Jun. 16, 1980, Ser. No. 160,092
Int. Cl.³ B27C *5/02*
U.S. Cl. 144—133 R **7 Claims**



1. Apparatus for notching a preformed wood molding piece at uniformly-spaced intervals to provide a dental molding effect, comprising:
(a) a worktable providing horizontal work support and vertical backstop surfaces for the length thereof;
(b) a plurality of powered wood routers spaced lengthwise of the table at uniform intervals and mounted for pivoting back and forth across and above the table such that the blades thereof may engage and notch any wood material in the path thereof during said pivoting;
(c) first controllable operator means for engaging and clamping an elongated wood workpiece against said horizontal and vertical surfaces at points not interfering with the path of pivoting of said router blades;
(d) second controllable operator means for pivoting said routers on the mountings thereof;
(e) third controllable operator means operative for indexing said workpiece by some predetermined distance; and
(f) control means for operating said first, second and third operator means in timed sequence whereby said workpiece may be engaged and clamped at a first position on said worktable, notched by each of said routers at such position, then unclamped sufficiently to permit advancement to a second position, followed by again being clamped to permit routing thereof, repeating said notch-

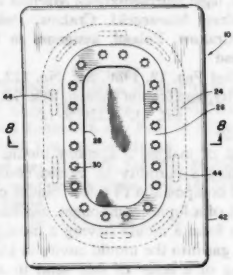
ing at said second position and repeating this sequence until the workpiece has been notched throughout its length to produce a dental-type molding therefrom.

4,326,573

DEFORMABLE FUEL CELL

Mike Brown, 4991 Canyon Rd., Claremore, and Jon Brook, 849 Millwood Rd., Broken Arrow, both of Okla.

Filed May 30, 1980, Ser. No. 154,950
Int. Cl.³ B65D *33/16*
U.S. Cl. 150—0.5 **10 Claims**



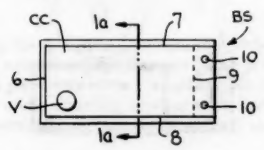
1. A fluid storage device comprising a unitary end seamless deformable body having an opening therethrough, and ring means bonded to the periphery of said opening.

4,326,574

FLEXIBLE CONTAINER WITH VALVE

Francesco Pallaroni, Piacenza; Luciano Baldini, Grosio, and Alberto Siccardi, Tirano, all of Italy, assignors to Safta S.p.A., Milan and Bieffe S.P.A., Grosotto, both of, Italy

Filed Dec. 6, 1979, Ser. No. 100,978
Claims priority, application Italy, Dec. 18, 1978, 30940 A/78
Int. Cl.³ B65D *30/24*
U.S. Cl. 150—8 **18 Claims**



1. A flat, flexible, sterilizable container capable of sterilely containing a liquid to be removed under absolutely sterile conditions, said container comprising a body portion having walls sealed on at least two sides and defining therebetween a liquid receiving and maintaining compartment, and a valve carried by said body portion and being penetratable by pointed instruments to provide access to liquid within the compartment:

said body portion walls comprising a first section of a three-layer laminate including:

(1) an outermost layer comprising a major proportion of a propylene polymer;

(2) an innermost layer comprising a copolymer of ethylene with a minor proportion of butylene; and

(3) an intermediate layer of an amide plymer; said valve comprising an elastomeric core having spaced major faces, said major faces being joined by sides, said core being covered on one of said faces by a second section of said three-layer laminate and the other of said faces being covered by a two-layer laminate including:

(a) a first layer comprising a copolymer of ethylene with a minor proportion of butylene; and

(b) a second layer comprising an amide polymer;

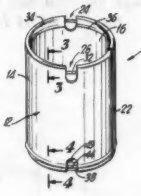
said two-layer laminate and said second section of said three-layer laminate covering said core of said valve being sealed to each other and said valve being sealed to a wall of said body portion.

4,326,575

DISPOSABLE WASTE RECEPTACLE

Sam Larkin, 245 Beach 104th St., Belle Harbor, N.Y. 11694

Filed Jun. 23, 1980, Ser. No. 161,856
Int. Cl.³ A45C *7/00*
U.S. Cl. 150—50 **12 Claims**



1. A waste receptacle comprising:

a disposable container including a collapsible bag having rigid ring means secured around its upper end portion for providing said upper end portion with a cylindrical configuration, said bag including rigid base means secured at its lower end portion for providing a bottom wall having a cylindrical configuration;

engageable means associated with said ring means and said base means for permitting said disposable container to be retained in an upstanding condition;

said base means including a rigid ring positioned about a bottom plate and secured by said lower end portion of the cylindrical bag; and

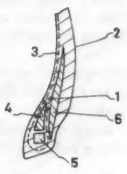
said bottom plate including a downwardly depending lip, said rigid ring being positioned about said lip.

4,326,576

RUBBER COMPOSITION EMPLOYING SOFT BLACK AND A THERMOSETTING RESIN AND TIRES EMPLOYING SAID COMPOSITION

Yasuhiro Mizumoto, Hadano; Yukio Tozawa; Masatoshi Kozima, both of Hiratsuka, and Masaru Hirai, Yokohama, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 66,543, Aug. 15, 1979, abandoned. This application Mar. 18, 1981, Ser. No. 245,184
Claims priority, application Japan, Aug. 25, 1978, 53-103567
Int. Cl.³ B60C *1/00, 15/06;* C08K *9/00*
U.S. Cl. 152—356 R **17 Claims**



1. A high hardness rubber composition having a hardness after curing of at least 92 comprising at least one rubber selected from the group consisting of natural rubber, diene type rubber and diene type copolymer rubber, a single vulcanizing agent for said at least one rubber, soft black, a novolak type

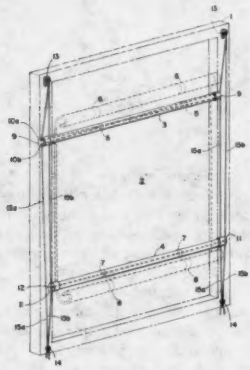
phenol or alkylphenol thermosetting resin wherein said single vulcanizing agent is sulfur and and a curing agent for said thermosetting resin, wherein the soft black has an average particle size of 40 to 80 millimicrons, the amount of the soft black is 55 to 95 parts by weight per 100 parts by weight of the rubber, the amount of the thermosetting resin is 5 to 30 parts by weight per 100 parts by weight of the rubber and the sum of the amounts of the soft black and thermosetting resin is 60 to 100 parts by weight per 100 parts by weight of the rubber.

4,326,577

VERTICALLY POSITIONING WINDOW SHADING SYSTEM

Brian H. Tse, 1486 17th Ave., San Francisco, Calif. 94122

Filed Apr. 16, 1980, Ser. No. 140,694
Int. Cl.³ A47H *1/00*
U.S. Cl. 160—259 **3 Claims**



1. A vertically positioning window shading system comprising:

a first upper hollow non-rotating horizontal roller;

a second lower hollow rotating roller parallel to said first roller;

a vertical screen having one of its parallel horizontal edges fixedly positioned upon said first roller and its opposite edge fixedly positioned on said second roller;

a first pair of cord means having one of their ends fixedly positioned on opposite sides of the upper edge of a window frame;

said first pair of cord means being disposed to suspend said first roller through its hollow center while permitting a vertical movement of translation of said first roller along said cords;

a second pair of cord members having one of their ends fixedly positioned on the opposite sides of the upper edge of said window frame;

said second cord means being disposed to suspend said second roller through its hollow center while permitting a combined movement of rotation and translation of said second roller;

said first roller being equipped with caps at each end, each of said caps having a pair of holes positioned one above the other drilled through them;

said second roller being equipped with caps at each end, each of said caps having a hole drilled through it concentric to said roller;

each of the cords of said first pair of cord means passing in turn through the upper of said holes in one end of said first roller, thence through the interior of said first roller thence through the lower of said holes in the opposite end of said roller thence vertically to a fixed position at the bottom of said window;

each of the cords of said second pair of cord means passing in turn through said concentric hole in one end of said second roller thence through the interior of said second roller, thence through the hole in the opposite end of said roller, thence vertically to a fixed position at the bottom of said window;

said cord means being maintained under tension at all times.

4,326,578

METHOD FOR MAKING FOUNDRY MOULDS AND CORES

Andrzej Pajak; Tadeusz Olszowski, both of Crakow, Poland; Antoni Mazur, deceased, late of Niepolomice, Poland (by Irena Mazur, legal representative); Mariusz Holtzer, Crakow, Poland; Andrzej Marzencki, Crakow, Poland, and Adam Jachowicz, Crakow, Poland, assignors to Instytut Odlewnictwa, Poland

Filed Feb. 19, 1980, Ser. No. 122,262
Claims priority, application Poland, Feb. 16, 1979, 213514
Int. Cl.³ B22C *9/12*
U.S. Cl. 164—15 **1 Claim**

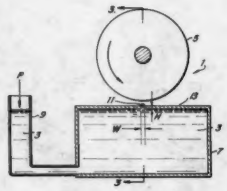
1. A method of making a foundry mould comprising the steps of: forming a plurality of mould components from a moulding sand composition of a low binder content having a certain content of a liquid component; assembling said mould components to form a mould having a mould cavity therein; pouring liquid gas into the mould cavity in an amount to produce hardening of a layer of said sand to a predetermined thickness only, said layer of the sand being that which will be in contact with molten metal; and leaving said liquid gas in said mould cavity until it completely evaporates.

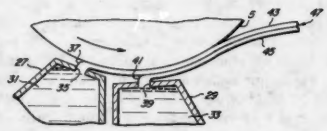
4,326,579

METHOD OF FORMING A FILAMENT THROUGH MELT EXTRACTION

Robert B. Pond, Sr., Westminster, and John M. Winter, Jr., New Windsor, both of Md., assignors to National-Standard Company, Niles, Mich.

Filed Jan. 23, 1980, Ser. No. 114,398
Int. Cl.³ B22D *11/06*
U.S. Cl. 164—461 **19 Claims**





1. A method of forming a filament through melt extraction comprising:

(a) providing at least one source of molten material;

(b) feeding the molten material substantially upwardly through at least one orifice having an elongate configuration, wherein the orifice is defined by a slot formed in a plate, with the slot having a width to height ratio of less than or equal to approximately 1 for providing a uniform distribution of fluid feed pressure across the entire length of the slot;

(c) maintaining a stable meniscus of the molten material about the periphery of the orifice; and

(d) rotating a chill wheel against the meniscus of molten material to extract a solidifying filament of the material therefrom.

4,326,580

METHOD OF FABRICATING A STRUCTURAL MEMBER BY ELECTRO SLAG FORMING

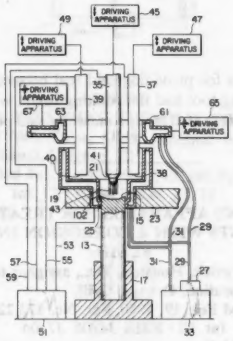
Takeshi Wada, and Tetsuo Okuni, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 16, 1979, Ser. No. 85,301

Claims priority, application Japan, Oct. 16, 1978, 53/126229; Feb. 2, 1979, 54/10444

Int. Cl.³ B22D *27/02*

U.S. Cl. 164—497 **6 Claims**



1. A method for fabricating a structural member by electro slag forming, which method comprises the steps of:

preparing a previously formed structural part for forming a first part of the structural member to be fabricated;

disposing vertically the previously formed structural first part;

mounting fluid-cooled metal mold means on the previously formed structural first part so that the upper end of the previously formed structural first part and the fluid-cooled metal mold means will define a cavity for forming a second part of the structural member to be fabricated;

supplying flux into the cavity;

arranging at least an electrode provided with a plurality of fine wires in the cavity so that the ends of the plurality of fine wires will face the upper end of the previously formed structural first piece;

applying electric voltage between the electrode and the fluid-cooled metal mold means so that initially arcs occur between the plurality of fine wires and the previously formed structural first piece to melt the fine wires, and then the flux and the electrode are melted in turn;

removing the electrode from the cavity filled with a sufficient amount of molten metal to form said part of the structural member to be fabricated; and

removing the fluid-cooled metal mold means from the structural member fabricated after solidification of the molten metal.

4,326,581

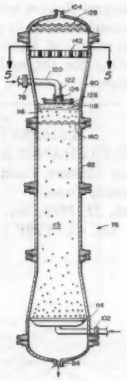
DIRECT CONTACT, BINARY FLUID GEOTHERMAL BOILER

Pascal M. Rapier, Richmond, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 27, 1979, Ser. No. 107,791

Int. Cl.³ F28D *21/00*

U.S. Cl. 165—45 **31 Claims**



1. A heat exchanger for the transfer of energy from an elevated temperature fluid including geothermal brines to a working fluid flowing in a specified direction comprising:

means for directly contacting the elevated temperature fluid with the working fluid in a transitional zone to cause said working fluid to vaporize; and

which means located closely adjacent to the transitional zone include means for directing the elevated temperature fluid across the surface of the transitional zone in a direction substantially transverse to said specified direction to prevent the entrainment of the elevated temperature fluid in the vapor of the working fluid.

4,326,582

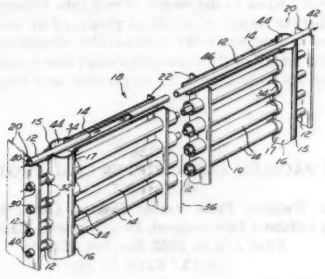
SINGLE ELEMENT TUBE ROW HEAT EXCHANGER

Irwin E. Rosman, Woodland Hills, and William R. Wagner, Los Angeles, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 24, 1979, Ser. No. 78,125

Int. Cl.³ F28D *7/10*; F28F *9/26*

U.S. Cl. 165—83 **10 Claims**



1. A tube-in-tube heat exchanger having the capability of being modularized, which comprises:

at least one inner tube having forward and aft ends for carrying a first heat exchanger fluid;

an outer tube having forward and aft ends, concentric with each inner tube, for carrying a second heat exchanger fluid;

means for manifolding said inner tubes; and

a flexible arcuate thin wall manifold for said outer tubes, wherein said manifold further compresses an integral flange for each inner and outer tube and wherein said flange defines ports for said inner and said outer tubes wherein said integral flanges extend beyond the circumference of said manifold so as to provide means for joining said tubes to said manifold, and wherein said joint is capable of withstanding the thermal stresses experienced by said heat exchanger.

4,326,583

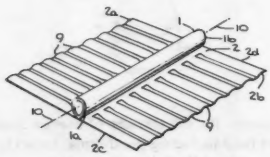
HEAT EXCHANGER PANELS

Wallace C. Rudd, New Canaan, Conn., assignor to Thermatool Corporation, Stamford, Conn.

Filed Jan. 21, 1980, Ser. No. 113,790

Int. Cl.³ F28F *1/20*

U.S. Cl. 165—183 **8 Claims**



1. A heat exchanger element comprising a metal tube substantially continuously secured to a relatively wide and thin metal sheet intermediate its side edges by heated and cooled metal whereby the metal sheet tends to form ripples upon cooling, the width of said sheet being substantially greater than the cross-sectional dimension of the tube and the width dimension of said sheet extending transversely to the axis of said tube substantially within the plane of said sheet, said sheet having a plurality of corrugations therein at each side of said tube extending in a direction transverse to the axis of said tube, the corrugations stretching the metal sheet and extending from adjacent the tube to the side edges of said sheet, the corrugations extending from adjacent the tube to one of the side edges being spaced from the corrugations extending from adjacent the tube to the other of the side edges so as to leave uncorrugated metal of the sheet therebetween, the tube being continuously welded longitudinally thereof to said uncorrugated metal of the sheet and, the number, depth and spacing of such corrugations being selected to foreshorten said sheet at each side of said tube so that the length of the sheet between its ends is substantially equal to the length of said tube between its ends and so that the ripples in said sheet produced by the joining of said tube to said sheet are substantially eliminated and the developed length of the corrugated sheet due to such stretching being not more than 2.5% larger than said length of said tube.

4,326,584

KELLY PACKING AND STRIPPER SEAL PROTECTION ELEMENT

Bruce J. Watkins, Palos Verdes Estates, Calif., assignor to Regan Offshore International, Inc., Torrance, Calif.

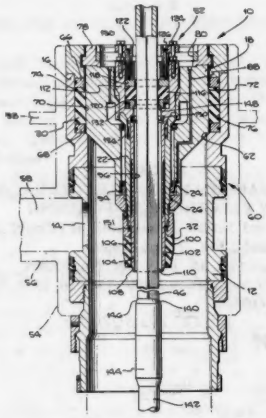
Filed Aug. 4, 1980, Ser. No. 174,946

Int. Cl.³ E21B *17/10*

U.S. Cl. 166—82 **20 Claims**

1. A stripper seal protection and operating tool sealing element adapted to protect a resilient annular stripper seal from contacting polygonally cross sectioned operating tools passing axially therethrough while maintaining a seal between the polygonal operating tool and the rotating insert of a diverter riser coupling, said element comprising:

stripper protection means for expanding radially outward said stripper seal to prevent said stripper seal from contacting said polygonal operating tool; and



packing means for providing said seal between the polygonal operating tool and the rotating insert when said stripper seal is prevented from contacting said polygonal operating tool.

4,326,585

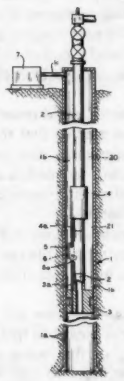
METHOD AND APPARATUS FOR TREATING WELL COMPONENTS WITH A CORROSION INHIBITING FLUID

David M. McStravick, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Feb. 19, 1980, Ser. No. 122,224

Int. Cl.³ E21B *34/08, 37/06*

U.S. Cl. 166—244 C **14 Claims**



1. Apparatus for injecting a quantity of corrosion inhibitor fluid through a subterranean well, said well having an outer casing, a production string disposed in the casing and defining an annular space within the outer casing, said annular space being filled with a corrosion inhibiting fluid, the apparatus comprising: means for cyclically varying the pressure of said

fluid; a fluid pressure accumulator mounted on said production string, said accumulator having a fluid inlet passage communicating with the casing annulus and a fluid outlet passage communicating with the interior of the production string; a first valve preventing fluid passage from said accumulator into said fluid inlet; and a second valve opposing fluid passage from said pressure accumulator into the outlet passage, whereby a quantity of said corrosion inhibiting fluid is only periodically discharged into said outlet passage from said fluid pressure accumulator.

12. The method of injecting a quantity of corrosion inhibiting fluid through apparatuses in a subterranean well having a production string disposed in a casing and surrounded by an annular space filled with fluid comprising the steps of:

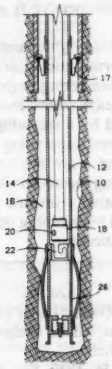
1. inserting a corrosion inhibiting material in the annulus fluid;
2. disposing a valving apparatus between the annular space and the interior of the production string; and
3. applying a cyclically varying pressure to said inhibitor containing fluid; and
4. periodically opening the valving apparatus only in response to the low pressure portions of said cyclic fluid pressure variations to discharge a limited quantity of said inhibitor containing fluid into the production string.

4,326,586

METHOD FOR STRESSING THERMAL WELL CASINGS

Lawrence B. Wilder, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 3, 1980, Ser. No. 165,522
Int. Cl.³ E21B *33/14, 33/16*
U.S. Cl. 166—285 **3 Claims**



1. A method for stressing a string of casing suspended in a borehole drilled in the earth wherein fluids will flow at a temperature greater than the initial temperature at which said casing is cemented comprising:

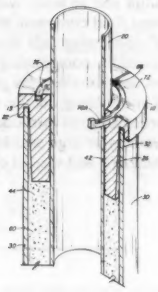
a. suspending said casing in said wellbore,
b. suspending a string of tubing in said casing,
c. attaching the lower end of said tubing to the lower portion of said casing,
d. circulating cement into at least a portion of the annulus between said casing and the wall of said wellbore,
e. stressing said tubing thereafter but before said cement has set,
f. maintaining said stress on said tubing until said cement has set, thereby setting said casing in a stressed condition.

4,326,587

CASING HANGER AND STABILIZER APPARATUS AND METHOD

Charles F. Gauthier, P.O. Box 775, and Michael L. Martin, P.O. Box 792, both of Lake Arthur, La. 70549

Filed Jun. 27, 1980, Ser. No. 163,928
Int. Cl.³ E21B *19/10, 33/04*
U.S. Cl. 166—379 **12 Claims**



1. An apparatus for stabilizing casing pipe, comprising:

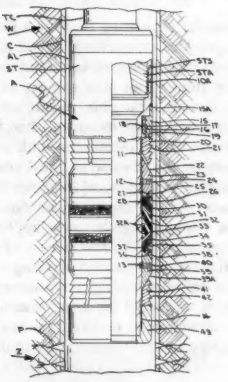
(a.) a cylindrical body portion with an inner bore throughout;
(b.) a means for engaging pipe casing within said inner bore;
(c.) a portion of said cylindrical body adapted for hanging said body onto the uppermost end of exterior pipe casing comprising a downward depending lip portion defining a space being substantially equal in width to the thickness of the pipe wall for engaging the uppermost end of the exterior casing pipe;
(d.) a locking means for securing said apparatus around the pipe casing prior to lowering the apparatus in place.

4,326,588

WELL TOOL HAVING KNITTED WIRE MESH SEAL MEANS AND METHOD OF USE THEREOF

David M. McStravick, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Feb. 19, 1980, Ser. No. 122,225
Int. Cl.³ E21B *33/128, 33/129*
U.S. Cl. 166—387 **30 Claims**



22. An apparatus adaptable for insertion on a first conduit within a subterranean well having a second conduit extending therein, and responsive to means for anchoring said apparatus

at a predetermined location in a subterranean well, said apparatus comprising seal means for preventing fluid transmission thereacross, said seal means comprising at least one section of transversely compressible, seamless, knitted elements generally defined by a continuous series of interlocking ductile metal-containing loop members and further comprising fibrous means, introduced among said loop members, for preventing fluid transmission through said knitted elements.

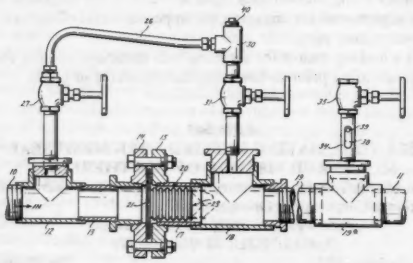
29. A method of establishing a seal in a subterranean well between a first conduit and an inner wall of a second conduit in said well to prevent fluid communication thereacross; comprising the steps of positioning said second conduit with respect to said first conduit; compressing a knitted wire mesh comprising seamless, knitted elements generally defined by a continuous series of interlocking ductile, metal-containing loop members with a fibrous material introduced among said metal-containing loop members to urge said knitted wire mesh into contact with both said first and second conduits to form a seal therebetween.

4,326,589

ANTI-FREEZE ARRANGEMENT FOR SPRINKLER SYSTEMS

Frederick C. Ballman, Fort Smith, Ark., assignor to Baldor Electric Company, Fort Smith, Ark.

Filed May 14, 1979, Ser. No. 38,481
Int. Cl.³ A62C *35/00*
U.S. Cl. 169—5 **5 Claims**



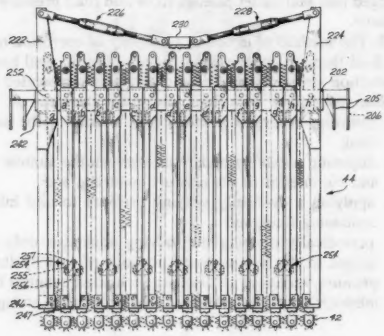
1. In a system for separating fluids in a fluid system such as an automatic sprinkler, comprising: a fluid pipe for connection to a second fluid pipe subjected to a fluid under pressure, and for conducting fluid to an area subject to adverse physical conditions; a flexible, frangible membrane across the pipe sealing the entrance thereof; means to admit fluid to the pipe to fill it downstream of the membrane with a first fluid not affected adversely by the adverse physical condition; means for connecting the pipe to the second fluid pipe for introduction of a second pressure fluid on the upstream side of the membrane; the membrane being frangible upon application of the upstream fluid pressure thereto and release of the fluid pressure downstream thereof, the membrane being a flexible bellows, the end of the bellows having a weakened tab that can be broken out upon release of the downstream pressure, but the tab having an unweakened portion that holds it onto the bellows; a bypass pipe from the second pipe to the first one around the bellows; a valve controlling the bypass; a fluid inlet into the first pipe and a valve controlling it; an exhaust opening into the pipe downstream of the bellows, and a valve controlling the exhaust; and an indicator for the fluid in the pipe downstream of the bellows.

4,326,590

PLANT-HARVESTING DEVICE FOR USE WITH VARIABLE CROP ROW SPACING

Michael J. Yancey, Puyallup, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Oct. 27, 1980, Ser. No. 200,863
Int. Cl.³ A01D *25/00*
U.S. Cl. 171—61 **10 Claims**



1. In a plant lifting apparatus of the type utilizing opposed belts for grasping and transporting a plurality of rows of plants, the improvements which comprise:

a. individual supporting means for each pickup belt;

b. sub-frame means for mounting the supporting means on the lifting apparatus;

c. pivot means which attach the individual supporting means to the suframe in a swingable side-by-side relationship;

d. adjusting means for moving the lateral supporting means between relatively inward and relatively outward positions, said adjusting means adapted to move the lateral supporting means independently of any medial supporting means,

e. spreading means bridging the medial supporting means so that when n supporting means are present, where n is an even number and numbering begins with one of the lateral supporting means, each even-numbered medial supporting means is connected by a spreading means to its adjacent higher odd-numbered supporting means, but lateral supporting means 1 and n are not connected to a spreading means, said spreading means serving to shift the connected pairs between relatively inward and relatively outward positions while still maintaining opposing pickup belts in a plant grasping relationship.

4,326,591

SOIL CORING IMPLEMENT

Jerry A. Dedoes, Wixom, Mich., assignor to Dedoes Industries, Inc., Walled Lake, Mich.

Filed Feb. 14, 1980, Ser. No. 121,432
Int. Cl.³ A01B *45/02*
U.S. Cl. 172—22 **3 Claims**

1. A soil penetrating and coring implement adapted to be connected to and pulled over a ground surface by a vehicle, said implement comprising:

a tubular cylindrical rim of a predetermined axial length, said rim having a plurality of circumferentially extending slots formed about its outer periphery, said slots being circumferentially and axially spaced from each other;

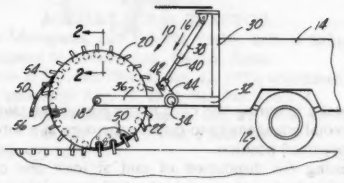
axle means for rotatably mounted said rim so that said rim rotates about its axis as the implement is pulled by the vehicle;

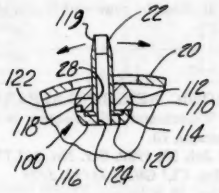
a plurality of elongated mounting assemblies, said mounting assemblies being substantially cylindrical in shape along their entire length, and means for individually detachably

and freely pivotally securing said assemblies to the interior of said rim so that said assemblies are circumferentially spaced about said rim and pivotal about an axis parallel to but radially spaced from the axis of said rim; and

a plurality of tubular coring elements and means for detachably securing a plurality of said coring elements to each mounted assembly, each coring element registering with a diametric throughbore in its mounting assembly and having a portion extending radially outwardly from one side of its mounting assembly, said outwardly extending portion of each coring element extending through a registering slot in said rim and protruding radially outwardly from said rim;

whereby said mounting assemblies are individually removable from said rim whereupon said coring elements are individually replaceable in said removed mounting assembly wherein each mounting assembly further comprises a first elongated part and a second elongated part, each part having a longitudinally extending and substantially planar surface which flatly abuts against a like surface on the other part,





wherein each diametric throughbore is formed by registering bores formed through the mounting assembly parts, said registering bores extending substantially perpendicularly with respect to said surfaces,

wherein each coring element includes a flared out portion at one end having a cross sectional area greater than the diameter of said registering bores, said coring elements being insertable through bores in one mounting assembly part so that the flared out portion abuts against said surface of said one mounting assembly part, and fastening means for detachably securing said parts together so that said flared out portion of said coring elements are sandwiched in between said surfaces on said mounting assemblies wherein the other mounting assembly includes a recess in its planar surface around each bore and in which the flared out portion of the coring element is positioned and wherein said means for pivotally securing each mounting assembly comprises a socket detachably secured to each rim, each socket having a cylindrical recess into which one end of the mounting assembly is positioned.

4,326,592

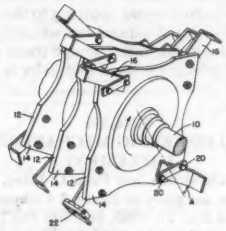
TOOL FOR EARTHWORKING MACHINE

Earle W. Stephenson, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Continuation-in-part of Ser. No. 13,720, Feb. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 785,453, Apr. 7, 1977, abandoned. This application Jun. 8, 1979, Ser. No. 46,944

Int. Cl.³ A01B *33/10*

U.S. Cl. 172—123 **17 Claims**



1. An earthworking tool comprising; an arm, said arm having a shank portion, said shank portion adapted to be supported on a rotary member having an axis of rotation, one end of said shank portion of the arm extending generally radially outwardly from the member, said one end of said shank portion joining a working end portion of said arm extending laterally to one side of said shank portion in a direction substantially parallel to said axis of rotation so as to provide said arm with an L-shaped configuration when viewed along a line perpendicular to said axis of rotation, said shank portion and said working end portion having a forwardly facing side and a trailing side with respect to a given direction of rotation of said arm, abrasion protective means mounted on said working end of said arm and disposed in linerly extending relation to said forwardly facing side thereof and to a portion of said forward face of the radial portion of said shank portion.

4,326,593

REVERSIBLE PLOUGHS

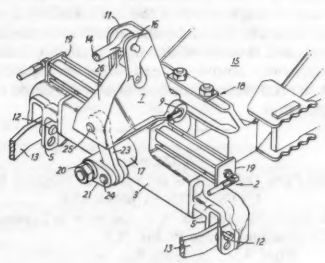
Richard J. Hawes, Ipswich, England, assignor to Ransomes Sims & Jefferies Limited, Ipswich, England

Filed Aug. 4, 1980, Ser. No. 175,031

Claims priority, application United Kingdom, Aug. 6, 1979, 27378/79

Int. Cl.³ A01B *3/28, 3/426*

U.S. Cl. 172—226 **6 Claims**



1. A reversible plough comprising a headstock for connection to a tractor; a reversing spindle mounted in the headstock for rotation about a generally longitudinal axis; a plough frame carrying left handed and right handed plough bodies and being secured to the reversing spindle for rotation therewith between

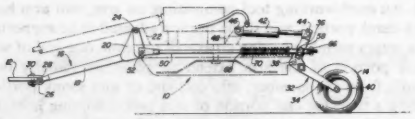
left and right handed ploughing positions, the plough frame having a centre of gravity which is offset laterally of said axis; means in the headstock for rotating the reversing spindle relative thereto to reverse the plough frame from one ploughing position to the other and a mechanism arranged upon rotation of the reversing spindle so to displace the plough frame vertically that the centre of gravity of the plough frame is maintained substantially in a horizontal plane, characterised in that said mechanism comprises means eccentrically connected with the reversing spindle and serving to tilt the reversing spindle in a vertical plane concomitantly with the rotation thereof, said eccentrically connected means applying to the reversing spindle an amount of torque about said axis which is opposed to the torque associated with the offset plough frame centre of gravity and which is substantial when said latter is at a maximum.

4,326,594

RAISING AND LOWERING MECHANISM FOR FARM IMPLEMENT

Ken K. Oka, St. Catherines, and Peter C. Haag, Port Colborne, both of Canada, assignors to Deere & Company, Moline, Ill.

Filed Jun. 27, 1980, Ser. No. 163,758
Int. Cl.³ A01B *63/22*
U.S. Cl. 172—328 **1 Claim**



1. Raising and lowering means for a tractor-drawn implement having a fore-and-aft body including front and rear support members pivoted to the body respectively on transverse axes, wherein the front member has a fore-and-aft tow bar is adapted to be pivoted to the tractor on a transverse axis and also has a generally vertical arm rigid with the tow bar, said transverse axis on the front support being located at an upper portion of said arm and the rear support member has a fore-and-aft wheel arm journalling a ground-engaging wheel means and also has a generally vertical arm rigid with the wheel arm, a fore-and-aft leveling rod connected between the rear vertical arm and a lower portion of the forward vertical arm to provide, in conjunction with the implement body, a four-bar linkage for selectively moving the body vertically in up or down phases, and force-exerting means connected between the body and one of the member arms for actuating the linkage in such manner that the rod is stressed in compression during lowering of the body, characterized in that a stop is fixed to the rod intermediate the arms and in fore-and-aft spaced relation to one of the arms, lug means is carried by said one arm and has an opening therethrough in which the rod is slidable fore and aft, and spring means is carried by the rod between the lug means and the stop and is compressible against the lug means by the stop to resiliently absorb at least some of the compressive forces on the rod when the wheel arm is subjected to stresses during operation.

4,326,595

METHOD FOR DRILLING DEVIATED WELLS INTO AN OFFSHORE SUBSTRATE

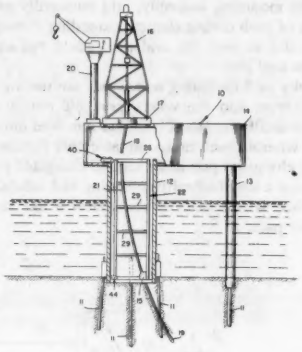
Robert B. Burns, Huntington, N.Y., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Apr. 25, 1980, Ser. No. 143,703
Int. Cl.³ E21B *7/12, 7/04*
U.S. Cl. 175—9 **7 Claims**

1. Method for drilling well bores into the ocean floor at an offshore site from a marine platform having a working deck, at least one platform leg supporting said deck above the water's surface, means for lowering a rotating drill string having a drill bit at the end thereof into the ocean floor, and a conductor cage adapted to hold at least one conductor, said cage being removably engaged with said leg and being positioned to receive said rotating drill string within said at least one conductor, and to deflect the drill string into a desired direction prior to the drill bit reaching the ocean floor, which method includes the steps of;

periodically elevating said cage from its drilling position within said at least one leg to a raised position,

pivotally engaging the cage lower end with said leg upper end,



pivotally lowering the cage upper end about said point of pivotal engagement to dispose the cage in a substantially horizontal position,

adjusting the disposition of said at least one conductor within said cage to guide the drill string into a predetermined direction,

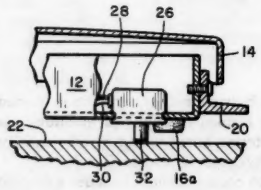
thereafter repositioning the cage within said leg for a drilling operation.

4,326,596

ELECTRONIC WEIGHING APPARATUS

William P. Beck, Westchester, Ill., assignor to Borg-Erickson Corporation, Chicago, Ill.

Filed Jul. 10, 1980, Ser. No. 167,770
Int. Cl.³ G01G *23/32, 3/14*
U.S. Cl. 177—178 **6 Claims**



1. In an electronic weighing apparatus including electrically powered scale means and a source of electrical power, the improvement comprising:

a base including a plurality of base supports positioned on a lower portion of the base to support the base on a support surface;

a platform mounted to the base to bear downward forces and to transmit downward forces to the scale means;

switch means for selectively connecting the scale means to the source to energize the scale means and disconnecting the scale means from the source to de-energize the scale means;

means for actuating the switch means, aid actuating means

including an actuating member biased to an extended position, in which the actuating member supports a portion of the base above the support surface, and movable to a depressed position, said switch means responsive to the actuating member such that the scale means is de-energized when the actuating member is in the extended position and the scale means is energized when the actuating member is in the depressed position; and

tab means for conducting externally applied vertical forces to the base to remove the actuating member to the depressed position to energize the scale means in the absence of applied vertical forces on the platform;

said actuating means biasing the actuating member to the extended position with a force adequate to prevent the weight of the weighing apparatus from moving the actuating member to the depressed position, thereby ensuring that the scale means is normally de-energized.

4,326,597

AGRICULTURAL TRACTOR

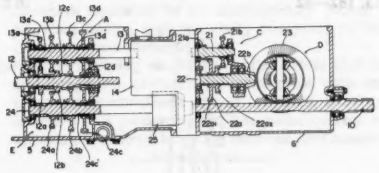
Yoshinobu Murayama, and Takashi Yoshii, both of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Continuation of Ser. No. 29,429, Apr. 12, 1979, abandoned. This application Apr. 21, 1981, Ser. No. 256,174

Claims priority, application Japan, Aug. 31, 1978, 53/107849

Int. Cl.³ B60K *17/08;* **F16H** *3/20*

U.S. Cl. 180—70 MS **5 Claims**



1. An agricultural tractor including an engine and comprising a transmission casing, said transmission casing including a forward portion and a rearward portion; a main speed change mechanism disposed in said forward portion of said transmission casing; said main speed change mechanism including an input shaft adapted to receive power from said engine; a plurality of gears mounted on said input shaft; a first output travel shaft parallel with said input shaft; a plurality of axially movable gears mounted on said first output travel shaft movable relative to said input shaft to provide plural speeds; a differential casing coupled to the rearward portion of said transmission casing; a speed change casing secured in the rearward portion of said transmission casing between said forward portion of said transmission casing and said differential casing; a low range speed mechanism in said speed change casing adapted to receive power from said first output travel shaft, said low range speed change mechanism including a plurality of gears related to each other which provide a greater reduction ratio than a maximum reduction ratio provided by said main speed change mechanism; said differential casing including therein an auxiliary speed change mechanism and a differential mechanism; said auxiliary speed change mechanism including a second travel shaft; said second travel shaft protruding into said speed change casing and connecting with said low range speed mechanism to transmit power from said low range speed mechanism through a third travel shaft to said differential mechanism.

4,326,598

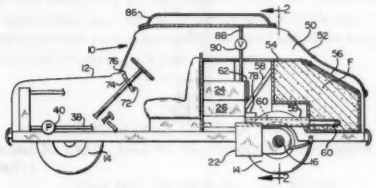
STEAM DRIVEN ROAD VEHICLE

Otto H. Acker, P.O. Box 2, Washougal, Wash. 98671

Filed Jun. 2, 1980, Ser. No. 155,523

Int. Cl.³ B60K *3/00*

U.S. Cl. 180—304 **1 Claim**



1. A steam driven road vehicle comprising

(a) a frame,

(b) wheel means supporting said frame on the ground,

(c) said wheel means including a drive axle,

(d) a firebox, steam boiler and condenser supported on said frame,

(e) steam powered drive means on said vehicle operated by steam from said boiler,

(f) a water supply system on said vehicle supplying water to said boiler,

(g) drive connection means connected between said powered drive means and said drive axle,

(h) a fuel bin on said frame arranged to hold a supply of powdered fuel for feeding to the firebox,

(i) first and second means connected between said fuel bin and said firebox for selectively conveying fuel from said fuel bin to said firebox, said first means comprising a power driven conveyor and said second means comprising a gravity feed chute,

(j) an electrical system in said vehicle, including plug-in means arranged for detachable connection to a conventional 110 volt circuit,

(k) an electrical pre-heating element on said boiler connected in said electrical system for producing pre-heat in said boiler,

(l) heat control means in said electrical system controlling the temperature of output of said pre-heating element,

(m) and time control means in said electrical system arranged to energize said pre-heating element at a preset time prior to driving the vehicle.

4,326,599

SPEAKER BEZEL/RETAINER

Phillip B. Thompson, Westminster, and Hill W. Roberts, Anaheim, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 1, 1981, Ser. No. 268,897

Int. Cl.³ H05K *5/00*

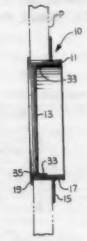
U.S. Cl. 181—175 **6 Claims**

1. A speaker grille bezel-retainer comprising:

a bezel terminating in a tubular portion having at least three groups of planar but radially intermittent, circumferentially oriented and axially displaced serrations arranged on the outside of said tubular portion with said radial intermissions at least equal to the length of said serrations;

a bezel ring having an inside diameter sized to slideably engage the outside diameter of said tubular portion of said bezel and having intermittent cut-outs stepped to a larger diameter so as to leave alternate tabs and cut-outs, said cut-outs oriented and sized to clear said at least three groups of planar but radially intermittent, circumferentially oriented and axially displaced serrations on said tubular portion of said bezel and said tabs shaped and sized

to form a ramp which axially advances said bezel ring when said bezel ring is rotated relative to said bezel with



said ramp engaging between aligned parts of said serrations; and

means for closing said inside diameter of said bezel.

4,326,600

INTAKE SILENCER FOR OUTBOARD MOTOR

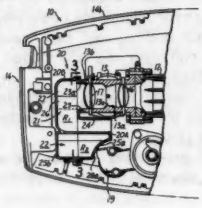
Masaki Okazaki, Iwata, and Ryozo Ohkita, Hamamatsu, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed May 30, 1980, Ser. No. 154,773

Claims priority, application Japan, Jun. 8, 1979, 54-72771

Int. Cl.[3] **F02M** *35/12;* **F01N** *1/02*

U.S. Cl. 181—229 **16 Claims**



1. An intake silencer for an outboard engine and a carburetor attached to said engine, said carburetor having an air intake port, said silencer comprising: an air intake passage having an open end and an end connected to said air intake port, said air intake passage bending partway around said carburetor, and a resonance chamber in fluid communication with said air intake passage between its ends, and also bending partway around said carburetor, in near adjacency to said air intake passage.

4,326,601

AERIAL LIFT PLATFORM APPARATUS WITH CAPACITY INDICATOR

John L. Grove, Greencastle, and Frederick W. Kuhne, Willow Hill, both of Pa., assignors to JLG Industries, Inc., McConnellsburg, Pa.

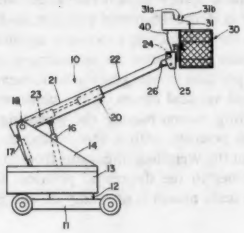
Filed May 30, 1980, Ser. No. 154,758

Int. Cl.[3] **G01D** *21/00;* **B66C** *13/14;* **B66F** *11/04*

U.S. Cl. 182—2 **17 Claims**

1. In a workman's lift platform apparatus comprising a telescopic boom pivotally mounted for luffing movement about a horizontal axis and having base and fly sections, means for extending and retracting the telescopic boom, means for luffing the boom, a workman's platform adjacent the outer end of the boom, a horizontal pivotal connection between the platform and the boom, means for maintaining the platform level during luffing movement of the boom, and control means on the workman's platform for controlling boom luffing and boom extension, the improvement comprising:

means on the fly section of the boom visible to a workman at said control means for visually indicating the amount of extension of the boom,



an indicator plate on said platform adjacent said control means having thereon visual indicating means corresponding to the indicating means on said boom fly section,

a cursor adjacent said indicator plate, and

means for moving said indicator plate proportionately to the angle of the boom to the horizontal.

4,326,602

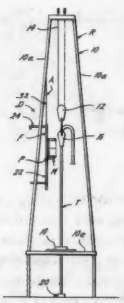
PORTABLE STABBING BOARD

Bill R. Bryant, Houston, Tex., assignor to Houston Tong Services, Inc., Houston, Tex.

Filed Jan. 5, 1979, Ser. No. 1,295

Int. Cl.[3] **E04G** *3/10;* **E21B** *19/00*

U.S. Cl. 182—82 **10 Claims**



1. A portable stabbing board adapted to be attached to a rig having rig sides formed of a plurality of braces, the portable stabbing board for supporting a worker while stabbing joints of tubular members together during running operations, comprising:

a frame member adapted to be affixed with the rig in a vertical plane substantially parallel with the tubular members, said frame member having an upper end and a lower end;

attachment means with said frame member for removably securing said frame member with the rig, said attachment means including bottom locating means affixed with said lower end of said frame member for universally locating said lower end of said frame member an appropriate distance from the rig to insure substantial vertical disposition of said frame member within the rig, said bottom locating means including at least one arm vertically adjustable and universally mounted with said frame member and extending from said frame member through the rig side of the rig for engaging a brace thereof;

a platform mounted for vertical movement along said frame member for supporting the worker during running operations;

power means mounted with said platform for providing motive force for moving said platform vertically with respect to said frame member; and,

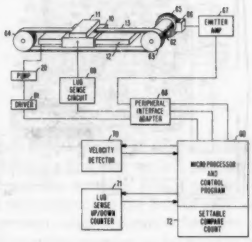
safety means with said platform and said frame member for preventing unwanted vertical movement of said platform during running operations.

4,326,603

LUBRICATION CONTROL APPARATUS

Berwin W. Darrow, Endwell, and David J. Wilkinson, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1979, Ser. No. 104,607
Int. Cl.³ F01M *1/18*
U.S. Cl. 184—6.1 **7 Claims**



1. Lubrication control apparatus comprising:

first and second relatively movable, electrically conductive members separated by an intermittently broken film of lubricant having high resistivity compared to the direct contact of said members;

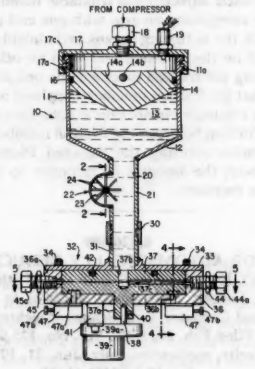
means for applying electric potential across said members and integrating current flow thereacross with respect to time during movement of said members; and 'means responsive to a predetermined integrated current level for applying additional lubricant between said members.

4,326,604

VEHICLE LUBRICATION SYSTEM

Peter Sotiropoulos, 42-11 78th St., Elmhurst, N.Y. 11373

Filed Oct. 15, 1979, Ser. No. 85,045
Int. Cl.³ F16N *13/22, 25/00*
U.S. Cl. 184—7 C **2 Claims**



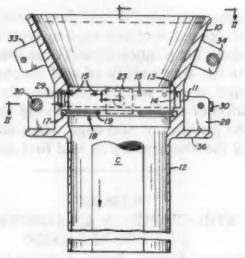
1. An apparatus for vehicle lubrication comprising a reservoir adapted to contain a quantity of lubricant, means for pressurizing said reservoir and said lubricant therein, a rotor and a rotor housing, duct means defined within said rotor, means connecting said duct means and said reservoir, a plurality of transmitting stations defined by said rotor housing, means for rotating said rotor successively into a plurality of positions to align said duct means with said transmitting stations, means for measuring the flow of lubricant from said reservoir into and through said rotor, means in conjunction with said measuring means for energizing said means for rotating said rotor, and means in conjunction with said rotor to deenergize said motor upon alignment of said duct means with one of said receiving stations.

4,326,605

LUBRICATING COLLAR FOR CABLE

Armand R. Conti, 3464 N. Wendover Cir., Youngstown, Ohio 44511

Filed Nov. 19, 1979, Ser. No. 95,890
Int. Cl.³ 118 *405*
U.S. Cl. 184—15 R **7 Claims**



1. Apparatus for applying lubricant to the outer surface of a cable for passage into a duct, said apparatus comprising an open-ended collar including a truncated, conically-shaped funnel section forming a cable entry guide joined integrally with an elongated and tubularly-shaped side wall forming an internal passageway with said funnel section to surround a length of a cable when positioned within the collar, said side wall having orifices to discharge lubricant into the internal passageway at a lubricant discharge station openly exposed by said cable entry guide and spaced from a cable discharge end of the collar, said cable entry guide being openly exposed to the lubricant discharge station to visually observe and monitor the discharge of lubricant onto a cable and to provide containment of the lubricant, said side wall further having a recess transverse to the internal passageway in the collar adjacent said lubricant discharge station and essentially between said lubricant discharge station and the cable discharge end of the collar, a spreader positioned in said recess for support by the side wall of the collar, said spreader including a holder supporting spreader means to project radially from the side wall of the collar into the internal passageway to contact and spread lubricant on the outer surface of the cable, and means for supplying lubricant to said orifices.

4,326,606

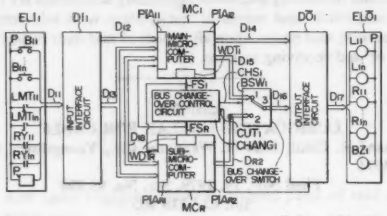
APPARATUS FOR CONTROLLING RESCUE OPERATION OF AN ELEVATOR

Soshiro Kuzunuki; Kotaro Hirasawa, both of Hitachi; Kazuhiro Sakata, and Kenji Yoneda, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 17, 1979, Ser. No. 85,543
Claims priority, application Japan, Oct. 19, 1978, 53/129289
Int. Cl.³ B66B *5/02*
U.S. Cl. 187—29 R **11 Claims**

1. A rescue operation control apparatus for an elevator

system, comprising an elevator cage available at plural floors; a first and a second computer for receiving at least the information about said cage and for sharing the processing of controlling the operation of said cage; a drive apparatus for driving said cage according to the control signals from said first and second computers; first detecting means for detecting an abnormality occurring in said first computer; second detecting means for detecting an abnormality occurring in said second



computer; means provided in said first computer for controlling the rescue operation of said cage by receiving the information at least about the position of said cage when said detecting means detects the abnormality of said second computer; and means provided in said second computer for controlling the rescue operation of said cage by receiving the information at least about the position of said cage when said first detecting means detects the abnormality of said first computer.

4,326,607

ANTI-RUST STRUCTURE OF AN ADJUST MECHANISM IN A DRUM BRAKE

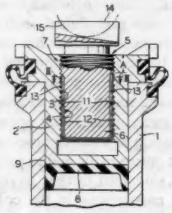
Tsutomu Chuwman, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 26, 1979, Ser. No. 97,426

Claims priority, application Japan, Mar. 17, 1979, 54-34559[U]

Int. Cl.³ F16D *65/46*

U.S. Cl. 188—79.5 S **5 Claims**



1. In an adjusting mechanism, for use in a drum brake, including an externally threaded adjusting bolt and a mating internally threaded adjusting nut having only one open end, said adjusting bolt and said adjusting nut being mutually engageable with and rotatable relative to each other for compensating for an increase in amount of operating stroke of said brake due to wearing of brake shoes thereof, an anti-rust structure comprising:

at least one groove axially extending along a length of said adjusting bolt in at least a part of an externally threaded portion of said adjusting bolt and having one end thereof starting from the tip of the adjusting bolt, the length of said axial groove being such that said adjusting bolt may not be pushed outwardly of said adjusting nut toward said open end thereof by compressed air confined and produced between said adjusting bolt and said adjusting nut even when said adjusting bolt has been threaded into said adjusting nut to such a maximum extent as to establish a relative position of said adjusting bolt and nut where said brake shoes are not worn at all, irrespective of distributing conditions of a grease being applied between said adjusting bolt and nut, and said length of said axial groove also being such that the other end of said axial groove is not positioned outside a brim of said adjusting nut when said adjusting bolt has been threaded into said adjusting nut to said maximum extent.

4,326,608

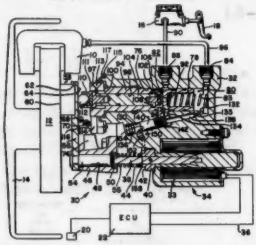
TRACTION CONTROL BRAKE ENERGIZER

Edward M. Pauwels, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 14, 1980, Ser. No. 140,284

Int. Cl.³ B60T *8/10*

U.S. Cl. 188—181 T **9 Claims**



1. In a wheeled vehicle having a rotatable member connected to a vehicle wheel, a brake engageable with the rotatable member for retarding the rotation of the rotatable member in response to fluid pressure braking signals, and control means for generating spin signals in response to a spin condition of the wheel, an anti-spin mechanism comprising:

a friction member engageable with the rotatable member independent of the brake;

actuating means for urging the friction member into engagement with the rotatable member in response to the spin signal, the engagement of the friction and rotatable members causing a motion of the friction member in response to rotation of the rotatable member;

generating means connected to the friction member for generating an anti-spin fluid pressure braking signal in response to the motion of the friction member;

the brake retarding the rotation of the rotatable member to eliminate the wheel spin condition in response to the anti-spin fluid pressure braking signal; and

a housing fixed adjacent the rotatable member, the friction member comprising an arm with one end portion engageable with the actuating means and slidably and rotatably mounted on the housing, and with an other end portion supporting the friction member, the one arm portion sliding so that the friction member translates into engagement with the rotatable member upon actuation of the actuating means, friction between the friction member and the rotatable member causing the engaged friction member to pivot about the housing in response to rotation of the rotatable member.

4,326,609

DEVICE FOR AUTOMATICALLY REDUCING EXCESS PLAY IN MOVABLE PARTS OF BRAKES

Franco Sala, Lugano, Switzerland, assignor to Steelyamamoto International Company Ltd., Schaan, Liechtenstein

Filed Feb. 29, 1980, Ser. No. 125,998

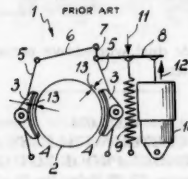
Claims priority, application Italy, Jun. 21, 1979, 23785 A/79

Int. Cl.³ F16D *65/58*

U.S. Cl. 188—196 BA **3 Claims**

1. A compensator device for automatically reducing excess

stroke or play in moving parts of a mechanism, such as a brake mechanism or brake actuating mechanism and the like, wherein a transmission mechanism transmitting motion from an actuator to said moving parts includes at least one axially movable motion transmitting rod-like member and at least one coupling member of the transmission mechanism connected with said rod-like member, wherein, according to the improvement, said rod-like member and said coupling member have coaxial screw-thread means providing screw-thread connection therebetween selectively allowing relative coaxial compensation movement there-between upon relative coaxial rotation thereof and wherein said rod-like member has crank means and said transmission mechanism has cam means, said crank



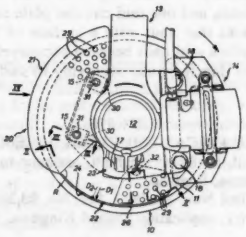
means being in cam follower engagement with said cam means, said cam means having a first cam surface portion parallel with the axis of said rod-like member and a second cam surface portion inclined with respect to the axis of said rod-like member thereby to prevent relative rotation between said rod-like member and said coupling member as long as the stroke of said rod-like member is within a normal range within which the engagement between said crank means and said cam means is maintained within the area of said first cam surface portion and to cause relative angular displacement between said rod-like member and said coupling member when the stroke of said rod-like member exceeds said normal range and the camming engagement between said crank means and said cam means occurs at said second cam surface portion.

4,326,610

PROTECTIVE SHIELD DEVICE FOR BRAKE

Jean-Claude Mouza, Courbevoie, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Mar. 18, 1980, Ser. No. 131,104
Claims priority, application France, Mar. 23, 1979, 79 07395
Int. Cl.³ F16D *65/847*
U.S. Cl. 188—218 A **16 Claims**



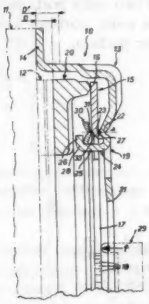
1. A protective shield device for a brake of the type including a hollow cylindrical rotating braking element fixed for rotation with a transverse end member, said shield device being a part annular configuration, said shield device comprising a plate part extending along a first limited circumferential region opposite the transverse end member, and a general helical sheet part extending from the first limited circumferential region of said plate part to a second limited circumferential region which penetrates deeply into an internal space of the rotating element toward the transverse end member, said helical sheet portion having a radial outer edge which is part circular and lies immediately adjacent an inner cylindrical wall of the rotating element, and said helical sheet part having means for ejecting foreign matter which may enter the internal space of the rotating element.

4,326,611

DIAPHRAGM CLUTCH COVER ASSEMBLY

Rene Billet, Lamorlaye, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed May 15, 1980, Ser. No. 149,981
Claims priority, application France, May 18, 1979, 79 12666
Int. Cl.³ F16D *13/44*
U.S. Cl. 192—89 B **2 Claims**



1. A diaphragm clutch cover assembly for a motor vehicle, including a generally annular cover having a flange radially extending from its outer periphery for securing said cover to a reaction plate or flywheel, a generally annular diaphragm spring having a Belleville washer peripheral portion and a central portion divided into radial fingers, assembly means for rockably mounting said diaphragm spring on said cover and axially applying a predetermined resilient clamping load, and a generally annular pressure plate against which said diaphragm spring peripheral portion bears, said pressure plate being fixed for rotation with and axial displacement relative to said cover, said diaphragm spring having a release load characteristic measured in line with the ends of said radial diaphragm fingers which for a given axial release travel from an initial position of the ends of said radial fingers passes through a peak value before reaching its final value at the end of the release travel when the ends of the radial fingers are in their final position, the peak values and the final values of the release load together depending on the axial distance which in the initial position of the ends of said radial fingers separates the face of the radial flange of said cover axially remote from the face of said pressure plate axially remote from said diaphragm spring and ranges between minimum and maximum reference distances, characterized in that the resilient clamping load on said diaphragm spring is between the peak value of the release load on said diaphragm spring at the minimum reference distance and the greater of the final value of the release load at the minimum reference distance and the maximum reference distance.

4,326,612

CONTROL DEVICE FOR MARINE GEARBOX AND ENGINE

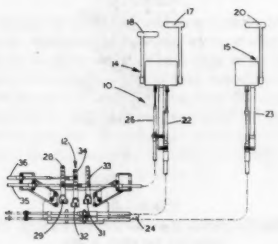
Jacob Kobelt, 6110 Oak St., Vancouver, British Columbia, Canada (V6M 2W2)

Filed Jan. 23, 1980, Ser. No. 114,606
Int. Cl.³ B60K *41/02*; G05G *9/14*
U.S. Cl. 192—0.096 **12 Claims**

1. A control function splitter apparatus for controlling

through at least one single lever control unit, a clutch and gearbox assembly, and a throttle associated with an engine; the control unit having a casing, a main throttle shaft adapted to cooperate with a speed control of the engine, an override throttle shaft, and a clutch operating shaft adapted to cooperate with a clutch of a reversible gearbox having an intermediate neutral position; the three shafts being journalled for rotation in the casing; the main throttle shaft and override throttle shafts being rotatable between idle and full speed positions; and the clutch operating shaft being rotatable between engaged forward and reverse positions with an intermediate position being neutral, the control function splitter apparatus being further characterized by:

(a) a cam mounted for rectilinear axial movement relative to the casing and being adapted to cooperate with the single lever control unit to reflect actuation thereof, the cam having an inner portion corresponding to intermediate cam travel and two outer portions corresponding to outer cam travel, the outer portions being positioned on each side of the inner portion,



(b) a cam follower cooperating with the cam and the main throttle shaft so that axial movement of the cam during intermediate cam travel produces no throttle shaft movement, and axial movement of the cam during subsequent outer cam travel produces corresponding rotation of the main throttle shaft,

(c) a motion converting means cooperating with the cam and the clutch operating shaft to convert axial movement of the cam during intermediate cam travel to rotation of the clutch operation shaft, and to prevent essentially further rotation of the clutch operating shaft during the subsequent outer cam travel,

(d) interlock means cooperating with the clutch operating shaft and the override throttle shaft so that rotation of the clutch operating shaft is essentially prevented unless both throttle shafts are in their respective idle positions, and rotation of the override throttle shaft is prevented unless the clutch shaft is in neutral.

4,326,613

SOLENOID ACTIVATED SPRING CLUTCH

Don M. Houlberg, Port Washington, Wis., assignor to Joerns Furniture Company, Stevens Point, Wis.

Filed May 6, 1980, Ser. No. 147,139

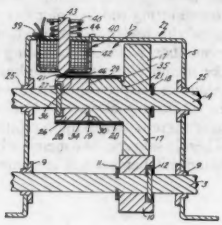
Int. Cl.³ F16D *13/08, 27/12*

U.S. Cl. 192—21 **13 Claims**

1. In a wrap-down spring clutch having a clutch drum selectively and constrictingly engaged by an associated clutch spring, the improvement comprising:

a solenoid connected with said clutch and having a coil, and a plunger with a free end which extends and retracts in response to energizing the coil; and wherein

said drum and said plunger are ferromagnetic, whereby energizing said coil extends the plunger free end abuttingly against said spring and urges said spring into frictional engagement with said drum, and simultaneously magnetizes said plunger, thereby creating a magnetic attraction between said plunger and said drum which further urges said plunger against said spring and said



drum to provide dual wrap-down pressure for effective clutch engagement.

4,326,614

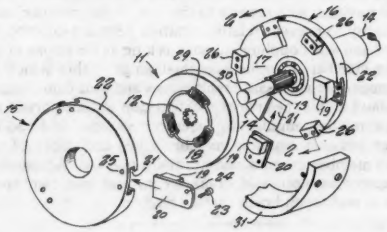
DISC CALIPER CLUTCH WITH EASY ACCESS AND BURNOUT PROOF ROTOR

Theodore T. Matagrano, 59-29 Palmetto St., Ridgewood, N.Y. 11385

Filed May 19, 1980, Ser. No. 151,252

Int. Cl.³ F16D *13/50, 69/04*

U.S. Cl. 192—70.13 **2 Claims**



1. A disc caliper clutch, comprising in combination, a rotor slidable on a spline of a shaft, said rotor being sandwiched between a front and rear circular plate so as to be engaged by both said plates, and each said plate having friction pads on a side thereof for frictionally engaging said rotor, means for easy removal of said pads for replacement thereof, wherein each said pad is mounted on a backing plate removably bolted to said circular plates, and one said circular plate carries a plurality of stop blocks that abut with a surface of the other said circular plate when said pads become excessively worn down so as to prevent damage form occurring to said rotor.

4,326,615

MECHANICAL COUPLING ASSEMBLY

Robin F. Powell, Stafford, England, assignor to GKN Sankey Limited, Bilston, England

Filed Nov. 13, 1979, Ser. No. 93,382

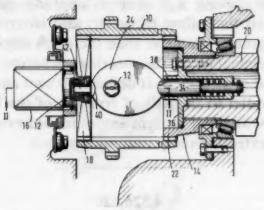
Claims priority, application United Kingdom, Nov. 22, 1978, 45603/78

Int. Cl.³ F16D *11/00*

U.S. Cl. 192—93 R **7 Claims**

1. A mechanical drive assembly comprising a driving gear member, a driven gear member axially spaced therefrom and a mechanical coupling therebetween wherein the coupling is provided with gearing to cooperate with said driving and driven gear members whereby rotational drive may be transmitted through the coupling from said driving gear member to said driven gear member; said coupling being axially moveable relative to said gear members so as to be selectively disengage-

able from at least one of said members; a cam member carried by said coupling and having opposed cam faces engageable with axially opposed faces of the driving and driven gear members, the cam member being rotatable between a first position in which one of said cam faces is engaged with one of said gear members and said coupling is maintained by said cam



member in engagement with both of said gear members and a second position in which the other of said cam faces is engaged with said one gear member and said coupling is disengaged from said one gear member and wherein rotation of the cam member between said first and second positions procures movement of the coupling between its engaged and disengaged positions.

4,326,616

CLUTCH SYSTEM FOR A VEHICLE

Haruo Mochida, Yokohama, and Hatsuo Kawashima, Shizuoka, both of Japan, assignors to Nissan Motor Company Limited, Yokohama and Fuji Kiko Kabushiki Kaisha, Tokyo, both of, Japan

Filed Nov. 6, 1979, Ser. No. 91,723
Claims priority, application Japan, Nov. 10, 1978, 53-138469
Int. Cl.³ F16D *13/75*
U.S. Cl. 192—111 A **12 Claims**

1. For a clutch actuation system for a vehicle which comprises a first assembly adapted to be driven from a stop position by an actuating force, and a second assembly, which is driven by the first assembly, and drives in a certain direction a driven member which moves in such a way that a first part of its travel is accomplished against a relatively weak resisting force, and a following part of its travel is accomplished against a relatively strong restoring force,

a clearance adjuster, comprising:

means for biasing the first and second assemblies with respect to one another in such a direction as, if the first assembly remains in its stop position, to drive the driven member in said certain direction with biasing force strong enough to overcome said relatively weak resisting force but not strong enough to overcome said relatively strong restoring force; and

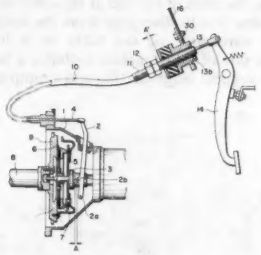
means for locking the position of said first assembly with respect to said second assembly when said first assembly is moved off its stop position.

4,326,617

CLEARANCE ADJUSTING DEVICE

Haruo Mochida, Yokohama, and Tetsuo Kobayashi, Ikeda, both of Japan, assignors to Nissan Motor Company, Limited, Tokyo, Japan

Filed May 16, 1980, Ser. No. 150,622
Claims priority, application Japan, Jul. 16, 1979, 54-90069
Int. Cl.³ F16D *13/75*
U.S. Cl. 192—111 B **11 Claims**



1. A device for adjusting a clearance between a certain member and another member, comprising:

a first elongate member having a male screw portion thereon;

a second elongate member having a female screw portion screwed with the male screw portion of the first member, an elongate notch formed in its axial direction, and a stopping portion provided in cooperation with the notch;

a locking coil member wound around the male screw portion of the first member, said locking coil member having a pair of outwardly bent portions set in the notch of the second member; and

control means fitted onto the second member so as to be movable relative to the second member within a limited range between positions in which the control means does not engage the stopping portion of the second member and a position in which the control means engages the stopping portion of the second member, for controlling the rotation of the second member in relation to the first member in such a manner that, when the control means does not engage the stopping portion of the second member, the control means is rotated to engage either of the pair of bent portions of the locking coil member so that the locking coil member is loosened thereby to move along the male screw portion of the first member, whereby the second member and the control means move together in a given direction, and that, when the control means moves toward and engages the stopping portion of the second member, the second member engages either of the pair of bent portions of the locking coil member so that the locking coil member is tightly locked on the male screw portion of the first member, whereby the second member is prevented from further rotating, and thereafter the control means is moved in the direction opposite to the said given direction by a predetermined distance whereby a desired clearance is set between the members.

4,326,618

SAFETY FEED TABLE RELEASE MECHANISM

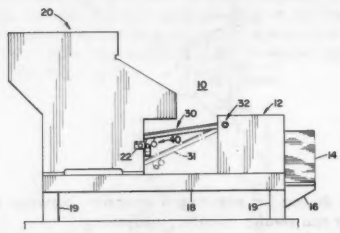
Richard L. Volpe, Hopedale, Mass., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jun. 17, 1980, Ser. No. 160,297
Int. Cl.³ B65G *11/00*
U.S. Cl. 193—17 **4 Claims**

1. A mechanism for releasably supporting the end of a table having its other end pivotally mounted, comprising:

a pair of table support brackets fixed in location relative to the pivotally mounted end of the table, the brackets being spaced from each other and lying generally along a common axis; and

a longitudinally extending rod mounted to the table at a location spaced from its pivotally mounted end, the rod being axially movable back and forth between two end positions, the rod lying generally along said common axis and being spring-biased toward one of said end positions, the ends of the rod at said one of said end positions lockably engaging the brackets when the table is in a raised position, the ends of the rod at the other of said end positions being free to disengage from the brackets to permit pivotal movement of the table to a lower position, wherein one of said brackets includes a horizontally extending support ledge portion and a ramp portion extending downwardly from a ledge portion end, the ramp portion sloping in a downward direction away from the end of the rod engageable with said one of said brackets, the rod being spring-biased toward the ramp portion, upward movement of the table from its lower position causing the end face of the rod end engageable with said one of said brackets to contact the ramp portion, continued upward movement of the table causing the ramp portion to apply a horizontal force component to the end face to axially move the rod away from said one of said brackets, the rod end engageable with said one of said brackets being supported from below by the ledge portion when, upon continued upward movement of the table, the end face reaches the top of and disengages from the ramp portion, the rod snapping back to its biased end position, the said rod end overlying the supporting ledge portion.



4,326,619

RELATING TO BEARING ASSEMBLIES FOR USE IN CONVEYOR ROLLERS

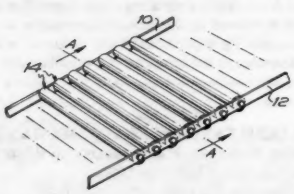
David M. Garnett, Thorpe Arch Trading Estate, Wetherby, Yorkshire, England (LS23 7BL)

Filed Dec. 26, 1979, Ser. No. 107,199

Claims priority, application United Kingdom, Sep. 7, 1979, 31142/79

Int. Cl.³ B65G *37/00*

U.S. Cl. 193—37 **5 Claims**



1. A bearing assembly for a roller comprising an inner race, an outer race and a plurality of rolling elements between the inner and outer races, one of said inner and outer races being adapted to be in operative connection with a sleeve body, whilst the other is for operative connection with a spindle means, and wherein there is an annular groove in one of the inner and outer races and an annular rim on the other of said inner and outer races which locates in said groove but does not contact the surfaces defining said groove so as to define a labyrinth seal having a U-shaped labyrinth passage dimensioned to resist the inflow of water, said labyrinth seal being located at a greater diameter than the pitch circle diameter of the rolling elements of the bearing, wherein said annular groove in one of said races is defined by two annular surfaces generally parallel to the axis of rotation of the bearing and a base surface which lies at right angles to said axis, and the said annular rim extends axially into said groove.

4,326,620

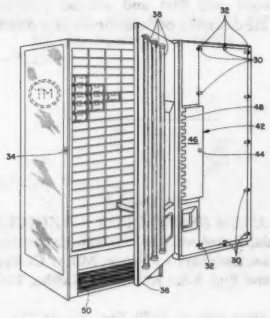
SECURITY PYLON FOR A VENDING MACHINE

Cristian J. Felix, Flushing, N.Y., and Donald M. Genaro, Haworth, N.J., assignors to PepsiCo Inc., Purchase, N.Y.

Filed Jan. 15, 1980, Ser. No. 112,170

Int. Cl.³ G07F *9/02*

U.S. Cl. 194—1 A **7 Claims**



1. A vending machine providing for the storage of cash receipts of the machine in a security pylon therein, comprising:

a. a vending machine having a front outer door formed as part of the front exterior panel of the vending machine to allow access to the interior of the machine for service operations, and a first lock for said outer door to prevent unauthorized access to the interior of the machine; and

b. a security pylon mounted behind and on the interior of the front outer door of the vending machine for storage of the cash receipts of the vending machine, and the rear panel of the security pylon having a second lock for said security pylon, whereby the cash receipts of the vending machine may be removed only after successively opening said first and second locks, said rear panel of the security pylon being pivotably mounted on one side relative to the security pylon, a coin handling unit mounted on the inside surface of said rear panel and being pivotably movable therewith, a coin chute and coin return toggle mechanism mounted in the security pylon on the interior of the front outer door and above the coin handling unit when said rear panel is closed and cooperating therewith respectively to deposit coins therein and actuate the coin return function of the coin handling unit, and a coin return chute and coin collection depository mounted in the security pylon on the interior of the front outer door and below the coin handling unit when said rear panel is closed and cooperating therewith respectively to return coins to a change hopper on the front panel of the vending machine and to accumulate the cash receipts thereof.

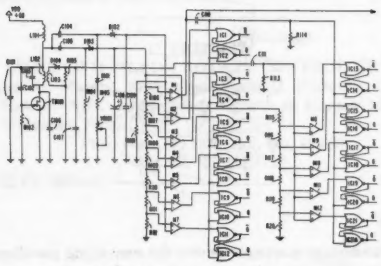
4,326,621
COIN DETECTING APPARATUS FOR DISTINGUISHING GENUINE COINS FROM SLUGS, SPURIOUS COINS AND THE LIKE

Ronald C. Davies, Las Vegas, Nev., assignor to Gaea Trade and Development Company Limited, Hong Kong, Hong Kong

Continuation-in-part of Ser. No. 21,305, Mar. 15, 1979. This application Jan. 18, 1980, Ser. No. 113,189

Int. Cl.³ G07F *3/02*

U.S. Cl. 194—100 A **12 Claims**



1. A multiple coin detecting apparatus for discriminating between denominations of coins and genuineness of coins so as to exclude from acceptance any coins which have not been specifically selected for acceptance, comprising:

(a) an oscillator circuit having a resonant tank circuit which provides amplitude modulation of the signal produced by the oscillator circuit in accordance with the losses of the tank circuit,

(b) coin directing means of insulating material having a vertical upper section and a vertical accept channel forming a completely free-fall chute for acceptable, coins, and a second channel for directing slugs and other unacceptable coins to a predetermined locality,

(c) said resonant tank circuit having an inductance means positioned completely around the coin directing means such that said inductance means forms an air-cored coil, with the coins passing therethrough forming the core of said coil, and the losses of the tank circuit being determined by the metal content of the coin,

(d) direction switching means for selectively accepting and rejecting coins and the like in accordance with the respective amplitude of a control signal, said direction switching means comprising a movably mounted member, and an accept solenoid for moving said member to an accept position dependent on its condition of energization, further characterized in that:

(e) said coil comprises a primary on said hollow core which with said resonant tank circuit performs a second function of inducing eddy currents in the coin, and

(f) a secondary coil surrounding said primary coil and having windings protruding a specified distance over the edges of said primary coil at a predetermined angle in relation to the windings of said primary coil and providing a secondary fluctuation in conjunction with the primary coil voltage fluctuation, such voltage fluctuations being of opposing polarities.

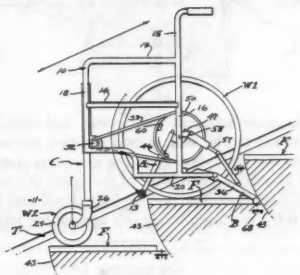
4,326,622
COOPERATIVE ESCALATOR AND WHEEL CHAIR

Floyd P. Ellzey, 2301 Marshallfield La., Redondo Beach, Calif. 90278

Filed Dec. 11, 1980, Ser. No. 215,417

Int. Cl.³ B66B *9/12;* **B62B** *9/10*

U.S. Cl. 198—322 **93 Claims**



1. The combination of an escalator and a wheel chair, and including;

the escalator having side walls spaced to closely pass spaced side frames of the wheel chair, an endless belt of flights extending between vertically spaced floor levels to move within the confines of the spaced side walls, and having lower and upper platforms at said spaced floor levels and means to maintain a horizontal disposition of the flights as they are vertically offset by means to form steps as the belt thereof is propelled by motor means,

the wheel chair having a main wheel support rotatable outside of each side frame and on a common axis aft of the center of gravity when a person is seated in the wheel chair, and a downwardly extensible wheel support at the front of each side frame and on independent lift axes well forward of said center of gravity,

a track extending between the lower and upper platforms, said track having variable displacement with respect to the vertical disposition of the flights,

and the wheel chair having control means engageable with the track to extend the wheel supports at the front of each side frame in response to the variable displacement of the track from the flights to depress said front wheel supports and controllably maintain the horizontal disposition of the wheel chair.

4,326,623
METHOD AND APPARATUS FOR FEEDING, CLAMPING, AND REMOVAL OF BAR OF TUBE GOODS

Theodor Zacharias, Meerbusch, and Hartmut Diel, Mönchen-Gladbach, both of Fed. Rep. of Germany, assignors to Friedrich Kocks GmbH & Company, Hilden, Fed. Rep. of Germany

Filed Mar. 5, 1980, Ser. No. 127,476

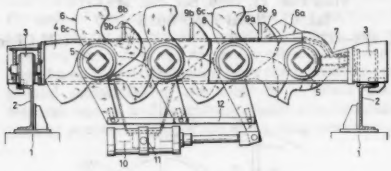
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1979, 2909769

Int. Cl.³ B65G *29/00*

U.S. Cl. 198—345 **9 Claims**

1. In apparatus for feeding, clamping, and removing of bar or tube goods, especially tubes, in tube test presses, which apparatus have a bearing surface consisting of several supporting crossbeams spaced parallel to each other, and at least two disk-like driven rotors having at least one hook-like peripheral projection spaced on at least one axis of rotation, where each axis of rotation runs crosswise to the crossbeams under their

bearing surfaces, such that only hook-like peripheral extensions of the rotors project above the bearing surfaces for transporting and clamping the goods, the improvement comprising at least one tenterhook pivotable adjacent the bearing surface between a first position below the bearing surface and a second position above the bearing surface of the crossbeam and parallel to the rotor adjacent each rotor, and which tenterhook when pivoted to the said second position above the bearing surface during clamping, grips the goods on side opposite the adjacent hook-like projection of the rotor involved, between said hook-like projection and the tenterhook and means reversing said rotor to clamp the goods against the tenterhook.



4,326,624

PALLET FEEDER

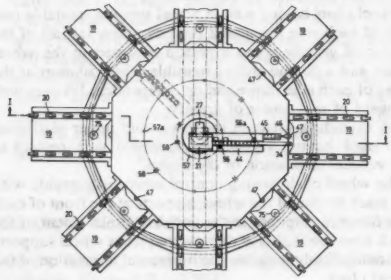
Norbert Ewertowski, Dietzenbach-Steinberg, Fed. Rep. of Germany, and Herbert Janser, Zürich, Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Sep. 8, 1978, Ser. No. 940,775

Claims priority, application Switzerland, Sep. 14, 1977, 11212/77

Int. Cl.³ B65G *47/46*

U.S. Cl. 198—370 **8 Claims**



1. A pallet feeder for a fabrication system having a pallet feed along a substantially circular-shaped path of travel, comprising:

support means defining a substantially circular-shaped track;

rotatable platform means mounted on said circular-shaped track for feeding said pallets along a substantially circular-shaped path of travel;

pallet receivers fixed on said rotatable platform means;

pallet guide means arranged on said pallet receivers and directed essentially perpendicular to the feed direction of said pallets;

means for rotating said rotatable platform means with said pallet receivers into a number of transfer positions and onto which pallet receivers said pallets can be automatically shifted in the direction of said pallet guide means;

a pallet thrust drive arranged substantially at the center of said pallet feeder;

means rotatably mounting said pallet thrust drive for movement into a number of angular positions about an essentially vertical axis and independent of the movement of said rotatable platform means; and

said pallet thrust drive being effective to engage a pallet arranged on said pallet guide means of said pallet receiver located in a transfer position for displacing said pallet in the feed direction.

4,326,625

TRANSVERSE CONVEYOR FOR CONVEYING PIN-SHAPED WORK PIECES IN A MULTI-STATION

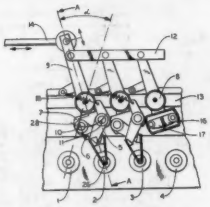
Horst Murzin; Rainer Wöss; Hans Burghoff; Frank Schmieder; Alfred Herzig; Johannes Junge, all of Karl-Marx-Stadt, and Gunter Deckarm, Limbach-Oberfrohna, all of German Democratic Rep., assignors to VEB Kombinat Walzlager und Normteile, Karl-Marx-Stadt, German Democratic Rep.

Filed Jun. 12, 1980, Ser. No. 158,853

Claims priority, application German Democratic Rep., Jun. 13, 1979, 213584

Int. Cl.³ B65G *25/00, 37/00, 47/84*

U.S. Cl. 198—653 **6 Claims**



1. A transverse conveyor device for conveying pin-shaped workpieces from one processing-station to the next processing-station, with gripper-arm pairs allocated to the processing stations, the individual gripper-arms having joints, the opening of said gripper-arm pairs being actuated by a control-mechanism, the gripper arms of each pair being intercoupled for opening and closing motions; the improvement wherein two gripper-arm pivot axes are located on a swivel-lever in the region of the processing-stations the swivel lever is pivoted at a swivel-bearing, said gripper arm pivot axes receive tong-shaped gripper-arm pairs and are movable along a circular path around the axis of the swivel-bearing, a curved-guide is provided having a geometrical shape the same as said circular path and wherein a roller connected to one of said gripper-arms of each pair is positioned to roll on said curved guide, said roller engaging said curved guide only when the respective gripper-arms are open.

4,326,626

SLAT CONVEYORS

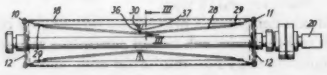
Ian P. Brockwell, Wyckoff, N.J., assignor to Alfa Laval Pty Ltd., Victoria, Australia

Filed Mar. 21, 1980, Ser. No. 131,929

Claims priority, application United Kingdom, Mar. 23, 1979, 10317/79

Int. Cl.³ B65G *39/20*

U.S. Cl. 198—845 **6 Claims**



1. A conveyor comprising guide rail means at each side of the conveyor, a pair of endless chains arranged one at each side of the conveyor and supported on said guide rail means for

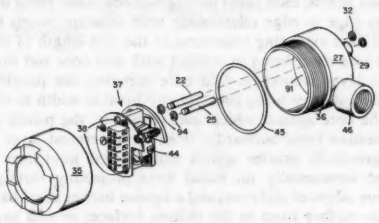
movement therealong, and a plurality of transverse slats mounted at their ends respectively on said chains, said slats being contiguous and cooperating with one another to provide a supporting surface for a product to be transported by the conveyor, wherein each slat comprises an elongated main plate having the longitudinal margins thereof bent downwardly through an angle in excess of 90° , the centre portion of the main plate between said longitudinal margins being substantially flat and adapted to provide said supporting surface, rod means extending along the main plate on the underside thereof, said rod means being in the shape of a shallow V, rod anchor means firmly securing the ends of the rod means to the longitudinal margins of the main plate at the associated ends thereof, and a central support firmly secured to the longitudinal margins of the main plate at the centre thereof and abutting the rod means at the centre thereof, said V-shaped rod means being arranged with each half section between the centre and an end thereof inclined relative to said centre portion of the main plate, and said central support being arranged to transmit to the centre of said rod means any deflection of the centre portion of the main plate due to load on said supporting surface when the conveyor is in use, whereby said deflection is resisted by longitudinal tension in said rod means.

4,326,627

LIMIT SWITCH FOR ROTARY CONTROL DEVICE

Roger G. Massey, Exeter, and David G. Holloway, Concord, both of N.H., assignors to Parker & Harper Mfg. Co., Worcester, Mass.

Filed Nov. 29, 1979, Ser. No. 98,625
Int. Cl.³ H01H *3/16*
U.S. Cl. 200—47 **3 Claims**



1. In combination, a rotary control device and a limit switch assembly for said rotary control device comprising:

a. A cam mountable on a rotary shaft of said control device for rotation therewith;

b. a mounting bracket securable to said rotary control device for enclosing said cam;

c. a limit switch housing comprising a body and a cover;

d. means to mount said body to said bracket;

e. at least one switch probe mounted to pass through said body and contact said cam;

f. at least one sensitive switch pivotally mounted in said body and having an actuator facing said probe; and,

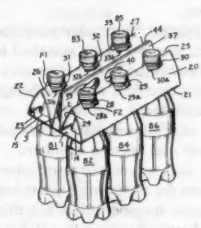
g. an adjustable spring loaded mounting pivotally positioning said switch for actuator adjustment, said sensitive switch having a first mounting point distant from said actuator, a second mounting point near said actuator, a fixed mounting support at said first mounting point about which said sensitive switch may pivot, and said spring loaded mounting support at said second mounting point held between two springs and adjustable by changing the tensions on said two springs whereby, when said cam bracket and body are mounted on said rotary control device, rotation of said cam with movement of said rotary control device moves said probe so as to operate said actuator opening and closing said switch at a point adjustable by said spring loaded mounting.

4,326,628

BOTTLE CARRIER

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 7, 1980, Ser. No. 205,583
Int. Cl.³ B65D *85/62, 71/00, 75/00*
U.S. Cl. 206—158 **19 Claims**



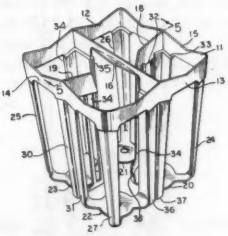
1. A carrier of the top gripping type for engaging outwardly projecting elements on and near the tops of a plurality of bottles arranged in at least one row, said carrier comprising a bottom panel, a plurality of bottle neck receiving apertures formed in said bottom panel and arranged in at least one row, a locking notch formed along a side portion of each of said neck receiving apertures, a first inwardly inclined side wall foldably joined to a side edge of said bottom panel opposite from said notches, an inwardly inclined support wall foldably joined at its upper edge to the upper edge of said inwardly inclined side wall, a plurality of support apertures formed in the upper portions of said side and said support walls and arranged to receive the upper portions of the necks of said bottles and to engage said outwardly projecting elements of said bottles, and a plurality of locking tabs formed along the bottom edge of said support wall and arranged to engage said notches respectively so as to interconnect said inwardly inclined support wall with said bottom panel.

4,326,629

BOTTLE CARRIER

Benjamin Tate, 1422 Irwin Dr., Erie, Pa. 16505

Filed Apr. 21, 1980, Ser. No. 142,383
Int. Cl.³ B65D *81/26, 1/24, 25/04*
U.S. Cl. 206—203 **1 Claim**



1. A carrier comprising a frame (10) a first side, a second side, a third side and a fourth side (12, 13, 14, 15) arranged in rectangular pattern integrally connected together at their corners.

a first partition attached to said second side and said fourth side, and extending inwardly therebetween,

a second partition and a third partition, said second partition being attached to said first side and extending inwardly towards said first partition in cantilever fashion and terminating short of said first partition,

a third partition integrally attached to said third side and

extending inwardly toward said first partition and terminating short thereof,

four spaced bottom members below said frame and arranged in a rectangular pattern with one said bottom member below each said corner, or said corner members integrally attached to said sides and extending downward therefrom, one said corner member being attached to each said bottom member,

four pairs of spaced intermediate members, one pair of said intermediate member being attached to each said side and extending downwardly therefrom,

each said intermediate member being attached to a said bottom member,

each pair of said intermediate members being attached to two adjacent said bottom members,

each pair of said intermediate members defining a space therebetween for receiving a partition of a crate,

two said bottom members that are diametrically opposite each other having an extending flange on the side thereof, opposite said corner member attached thereto,

and a downward extending member attached to each said second partition and said third partition and attached to said flange on the said diagonally opposite bottoms.

4,326,630

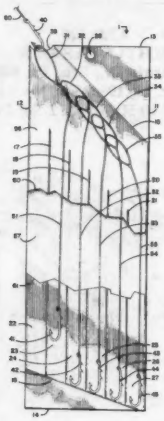
SNELLED HOOK PACKAGE AND PACKAGING METHOD

Carl J. Bacino, 4482 Fernbrook Rd., and Martin Lustig, 6768 Greengrove St., both of Las Vegas, Nev. 89103

Filed May 19, 1980, Ser. No. 150,886

Int. Cl.³ A61L *17/02*

U.S. Cl. 206—315 R **7 Claims**



1. A package containing a plurality of snelled fish hooks comprises a completely sealed container having a transparent flexible front panel, a rear panel substantially coextensive with the front panel, a plurality of discrete elongate parallel pockets within the container, access means to remove the snelled fishhooks from the container, each pocket having a snelled fishhook consisting of a leader with a fishhook on one end and a loop on the other end extended therein, and wherein each leader is threaded through the loop of the snelled fishhook in the immediately adjacent pocket.

4,326,631

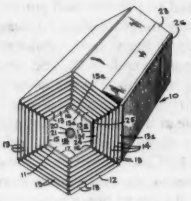
RIGID INSULATION ASSEMBLY

Charles A. Annand, P.O. Box 366, Truro, Nova Scotia, Canada (B2N 5C5)

Filed Sep. 21, 1979, Ser. No. 77,764

Int. Cl.³ B65D *85/66*

U.S. Cl. 206—389 **11 Claims**



1. A rigid insulation assembly comprising an elongated core member having a central axis and a continuous length of insulation material wound on said core member, said core member having a periphery thereof formed by a plurality of flat faces, adjacent faces about the periphery being joined at corners extending parallel to the axis of the core member so that the core through the length thereof has a constant polygonal shape in cross-section, the continuous length of insulation material including a flexible base sheet and a plurality of rigid insulating panels adhered to said base sheet, having top and bottom surfaces, said flexible base sheet being adhered to the top surface of said panels, each panel having side edges and being disposed in an edge to edge relationship with adjacent panels to form joint lines extending transverse to the said length of material, said base sheet being in contact with said core and the innermost layer wound on said core member, the panels in the innermost layer being substantially equal in width to the faces of the core against which said panels lie, the panels in each successive layer outwardly from the innermost layer having progressively greater widths whereby the joint lines are located substantially on radial lines projecting through said corner edges of said core, and a vapour barrier sheet having an inside surface fixed to the bottom surfaces of said panel and extending the length of said insulation material.

4,326,632

TWO-COMPONENT ADHESIVE BODY

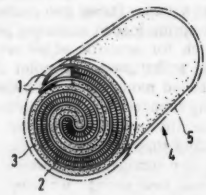
Friedrich Koob, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Dec. 11, 1979, Ser. No. 102,458

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2854094

Int. Cl.³ B65D *25/08*; B32B *7/10*

U.S. Cl. 206—389 **14 Claims**



1. An adhesive body for securing an anchor bolt within a borehole comprises at least one web material section wound around itself about a central axis so that from the central axis

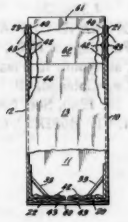
radially outwardly said web material section is in overlapping relationship to itself, wherein the improvement comprises an adhesive material including a resin component and a hardener component, said resin component and hardener component each coated directly on said at least one said web forming a layer of each said component on said at least one web with said at least one web forming the sole separating layer between said component layers so that said resin and hardener components are maintained in separated relation for preventing intermixing of said components prior to use of the adhesive body for securing an anchor bolt within a borehole, and said web material being folded over upon itself so that a double layer of said component of adhesive material is located between the doubled over section of said web material.

12. A method of forming an adhesive body for use in securing an anchor bolt in a borehole comprising directly coating separate face surfaces of a web material each with a different component of a two-component adhesive material, winding the web material around a central axis with the web material being wound around itself in an outwardly spirally arrangement and with the web material separating adjacent layers of different adhesive material components, folding the web material over upon itself so that the same component of adhesive material is located between the folded over face surfaces of the web material section and winding the web to a selected outside diameter.

4,326,633
SEALED BEAM HEADLIGHT CARTON

Joseph F. Schillinger, Morrison, Ill.; William B. Bicksler, Dubuque, Iowa, and Herbert L. Lambert, Manchester, Mo., assignors to Champion International Corporation, Stamford, Conn.

Filed Oct. 16, 1980, Ser. No. 197,578
Int. Cl.³ B65D *85/42*
U.S. Cl. 206—418 **6 Claims**

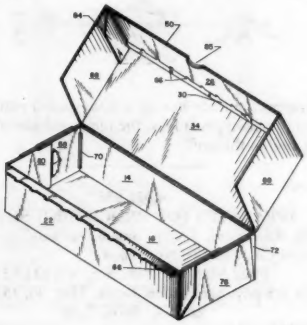


1. A shock absorbing carton for receiving and supporting a fragile structure; said shock absorbing carton being of tubular construction have a pair of opposite side walls and a pair of additional walls interconnecting the side walls; each of the pair of opposite side walls having a first flap extending from each end thereof; each flap having an additional panel foldably connected thereto and being folded into surface-to-surface relation with said first mentioned flap and secured thereto; said additional flap being narrower than said first-mentioned flap; a third flap secured to said additional flap along a fold line and foldable with respect thereto; said third flap and said additional flap together having a length greater than the length of said first-mentioned flap; said third flap, when said first-mentioned flap is folded into closing position with respect to the container, sliding down the associated side wall to a position in which it extends diagonally from said first-mentioned flap to said side wall; and a fourth flap foldably connected to said third mentioned flap; said fourth flap extending in surface-to-surface relation with the inside of the associated side wall when said first flap is closed to cover said end of said container; said first flaps on each of said first-mentioned walls being closed to form a cushion structure for receiving a fragile object with the third mentioned flaps extending diagonally between the first-mentioned flap and the inside of the associated side wall to provide a cushion for said object at each end; and additional flaps on the other walls for completing the closure of said container.

4,326,634
SIDE LOADING, TOP OPENING, RECLOSABLE CARTON

George L. Meyers, Ashland, Ohio, assignor to American Can Company, Greenwich, Conn.

Filed Sep. 26, 1980, Ser. No. 190,931
Int. Cl.³ B65D *5/26, 5/54*
U.S. Cl. 206—626 **9 Claims**



1. A carton comprising: a bottom wall; an upstanding front wall connected to the front edge of said bottom wall; an upstanding rear wall connected to the rear edge of said bottom wall; a top wall connected to one of said front and rear walls; and right and left side walls; each said side wall having a front side flap connected to, and projecting rearwardly from, said front wall, and having a male locking tab projecting rearwardly from its rear edge; each said side wall also having a pair of inner and outer rear side flaps connected to, and projecting frontwardly from, said rear wall; said rear side flaps being secured to each other in face to face relationship; said inner rear side flap having a first front edge substantially coincident with said rear edge of said front side flap, said outer rear side flap having a second front edge located frontwardly of said first front edge; each said side wall also having a bottom securing flap hingedly attached to each side edge of said bottom wall, said bottom securing flaps overlying, and being secured to, corresponding ones of both said outer rear side flaps and said front side flaps.

4,326,635
APPARATUS FOR REFINING ORE

Wayne H. Collins, 337 Essex St., Kearny, Ariz. 85237

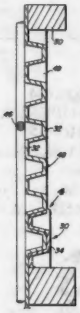
Filed Nov. 3, 1980, Ser. No. 203,261
Int. Cl.³ B03B *4/00*
U.S. Cl. 209—474 **10 Claims**

1. A refining apparatus for separating the heavier constituents from a mixture of materials, comprising:

aerating means having a mixture support surface provided with at least alternating permeable and impermeable regions on said surface for fluidly suspending at least portions of said mixture above said surface;

vibrating means coupled to said aerating means for shaking said mixture of materials so that said heavier portions tend to migrate to said surface and further so that said heavier

portions tend to come to rest on said impermeable regions; and



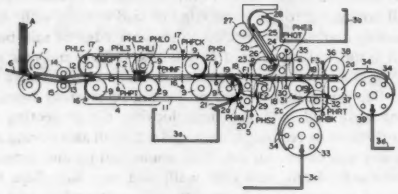
said support surface having a honeycomb-patterned plurality of pockets on at least the upper surface of the permeable region thereof.

4,326,636

APPARATUS FOR PROCESSING SHEETS

Moriatsu Kawakami, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1980, Ser. No. 131,822
Claims priority, application Japan, Mar. 20, 1979, 54-32809
Int. Cl.³ B07C *5/08*
U.S. Cl. 209—534 **7 Claims**



1. An apparatus for processing sheets which comprises:

means for feeding sheets one at a time from a stack of sheets;

conveyor means for receiving the sheets from said feeding means and for moving the sheets along a conveyor path;

detecting means comprising a plurality of sensors disposed in said conveyor path for detecting widths of the sheets and for generating signals representative of the sensed widths, for detecting whether the obverse side of the sheet is up and for generating a signal indicative of the sensed sheet side, and for detecting a sheet that cannot be discriminated and for generating a signal indicative of the sheet indiscrimination;

discriminating means electrically associated with said detecting means for discriminating the sheets into a plurality of groups, one group having sheets of a set kind with the obverse side up, another group having sheets of the set kind with the reverse side up, a third group having sheets of different kinds, and a fourth group having sheets that cannot be discriminated, and for generating signals indicative of said groups in response to a combination of signals from said detecting means;

sorting means disposed downstream of said detecting means in said conveyor path for sorting the sheets into said groups of sheets in response to said signals from said discriminating means; and

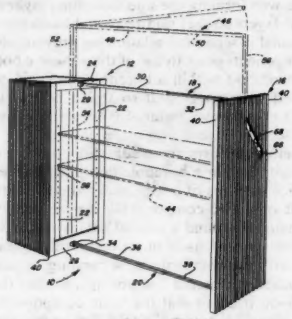
stacking means for stacking the sheets sorted by said sorting means.

4,326,637

HANG-RACK ASSEMBLY

Roger T. James, 1060 S. Charlotte, Lombard, Ill. 60148

Filed Apr. 28, 1980, Ser. No. 143,621
Int. Cl.³ A47F *7/24, 5/10*
U.S. Cl. 211—175 **15 Claims**



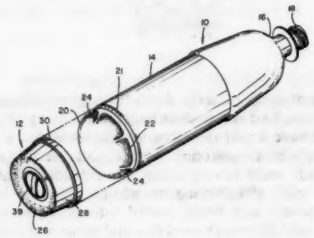
1. A hang-rack assembly for supporting and displaying articles of merchandise, comprising a base structure, wall means, and means for extendibly interconnecting said wall means to said base structure, said interconnecting means comprising at least one hang-rod and one tie rod, one end of the hang-rod being pivotally connected to the base structure and the other end of the hang-rod being pivotally connected to the wall means, one end of said tie rod being pivotally connected to said base structure and the other end being demountably connectible to said wall means.

4,326,638

COMBINATION BASE CUP AND BOTTLE

Gerhard E. B. Nickel, Farmington Hills, Mich., and Richard C. Darr, Medina, Ohio, assignors to Plastipak Packaging Division, Beatrice Food Co., Chicago, Ill.

Filed May 16, 1980, Ser. No. 150,247
Int. Cl.³ B65D *23/08*
U.S. Cl. 215—12 R **5 Claims**



1. In combination, a bottle having a generally convex, rounded bottom incapable of supporting the bottle in a stable, upright position, and a supporting cup applied to the bottom of said bottle, said bottom having angularly spaced, laterally outwardly bulged portions, said cup having a base extending across the bottom of said bottle and an annular side wall projecting upwardly from said base and surrounding said outwardly bulged portions, said side wall having detent means engaging over said outwardly bulged portions to retain said cup on the bottom of said bottle, the portions of said bottom between said bulged portions providing straps to resist the tendency of said bulged portions to become flattened due to pressure in said bottle, the base of said cup providing a support surface for supporting said bottle in a stable, upright position.

4,326,639
SCREW CAP FOR BOTTLE-TYPE CONTAINERS

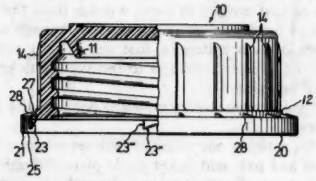
Otto Stahl, Finnentrop, and Horst Schulz, Hanover, both of Fed. Rep. of Germany, assignors to Georg Menshen & Co. KG, Finnentrop and Riedel-de Haen Aktiengesellschaft, Hanover, both of, Fed. Rep. of Germany

Filed Mar. 13, 1980, Ser. No. 130,071

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1979, 2910178

Int. Cl.³ B65D *55/12*

U.S. Cl. 215—252 **18 Claims**



1. A screw cap comprising a cap, the inside of which is threaded and adapted to be screwed on a threaded neck of a container;

a collar extending along the outer circumference of the cap and outwardly projecting therefrom;

a plurality of shearable links which join the collar to the cap along the circumference of the cap, said links being distributed along the circumference of the cap and extending radially therefrom to the collar; and a plurality of blocking teeth which are resiliently molded to the collar and which are adapted to engage stop teeth on the neck of said container in such a manner as to shear off said links when said cap is unscrewed from the threaded neck of the container;

said shearable links including first and second groups of shearable links, each of the links of the second group having a free length between the collar and cap which is several times greater than the free length of each of the links of the first group, having a flexibility which differs from the flexibility of each of the links of the first group and requiring, in order to be sheared off between the cap and collar, an angular torsion of the cap relative to the collar which is several times greater than the angular torsion required for the links of the first group to be sheared off between the cap and collar, each shearable link of the second group is associated with an oblique surface which is formed in the collar and which limits the deformation of the shearable link during the angular torsion of the cap, relative to the collar, in the direction of unscrewing.

4,326,640
CONTAINER SYSTEM FOR CARRYING AND SUPPLYING FOOD AND WATER FOR PETS

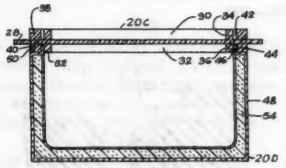
Nadine R. Nitzberg, 9610 Orpin Rd., Randallstown, Md. 21133; Michelle L. Baldwin, and Steven M. Baldwin, both of The Village Square North Apts., 9029 Contee Rd., Laurel, Md. 20811

Filed Jul. 10, 1980, Ser. No. 167,233

Int. Cl.³ B65D *21/02;* **A45C** *11/20;* **A47G** *23/04*

U.S. Cl. 220—4 E **1 Claim**

1. In a system of container elements vertically nestable in interconnection for providing covered storage and transport of animal food and drink the system including an upper element, a lower element, an intermediate element between the upper and lower elements, first and second means on the intermediate element for sealing together the upper and lower elements, and the upper and lower elements having means for engaging the sealing means, the improvement comprising: said sealing means comprising respectively relatively shallow identical feeding pans back-to-back in the intermediate element structure, the upper and lower elements comprising respectively relatively deeper containers open at the top, the open top of the upper element also having means for engaging the sealing means, a top element, third means for sealing on the top element, the third means for sealing comprising the top element having a horizontal portion with a relatively shallow feeding pan which is downwardly oriented therein and proportioned for engagement with all said means for engaging the sealing means, all said elements being generally co-extensive laterally, the top element and the intermediate element having respective planar flanges protruding all around beyond the perimeter thereof for protection and for gripping, all said elements having in plan view a rectangular shape with rounded corners, the means for sealing and the means for engaging having respective rim structures forming continuous double seal, said rim structures including double rim structure on said means for sealing and single rim structure on said means for engaging, proportioned for tightly fitting between said double rim structure, all said elements having foam insulation completely thereabout, the upper and lower elements having foam insulation in the lower most portions thereof and material encasing substantially all said foam structure except at the means for sealing, and a bail type handle for supporting all said elements when carried in assembly.



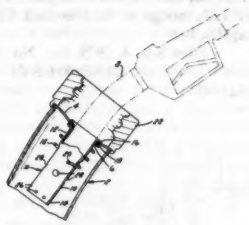
4,326,641
LIQUID TANK ANTI-THEFT DEVICE

Robert J. Wilken, 3128 Leslie La., Eau Claire, Wis. 54701

Filed Aug. 28, 1980, Ser. No. 182,012

Int. Cl.³ B65D *25/02;* **B67C** *3/00*

U.S. Cl. 220—86 AT **7 Claims**



6. In combination with a fuel-containing tank of a motor vehicle, a fuel tank anti-theft device for use in a tank filler tube for said tank and having a plate extending across an upper portion of said tube, said plate having an aperture of a size to limit the size of a filling nozzle to be inserted therein, said device comprising an elongated tubular member with an upper and lower end, an outwardly extending projection at said upper end of said tubular member, thread-like means on said tubular member to provide threaded engagement with said plate and entry of said tubular member into said tank filler tube, said thread-like means being inserted within said tube so that an upper part of said thread-like means abuts against the under side of said plate and said projection rests against the opposite side of said plate to prevent removal of said tubular member from said tube, and means at the lower end of said tubular

member to prevent insertion of a fuel removal means into said fuel tank.

4,326,642

TUBULAR CASE SEALING MEANS AND METHOD OF MANUFACTURING SAME

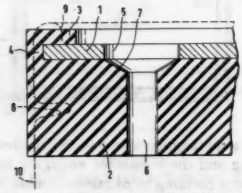
Franz-Josef Wolf, Bad Soden-Salmunster, Fed. Rep. of Germany, assignor to WOCO Franz-Josef Wolf & Co., Bad Soden-Salmunster, Fed. Rep. of Germany

Filed Nov. 18, 1980, Ser. No. 207,936

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1979, 2946578

Int. Cl.³ B65D *35/44, 43/00, 51/00*

U.S. Cl. 220—200 **5 Claims**



1. In a sealing means for a case of an electrical component, including a metal disk comprising at least one aperture for an electric feedthrough and one elastomer part acting as the sealing element, essentially covering completely at least the metal-disk inside facing the case inside, the improvement comprising:

the elastomer part as measured from the inside of the metal disk is at least twice as thick in the axial direction as the metal disk and furthermore prior to the intended use of the sealing means for sealing the case, the elastomer part covers and surrounds in sealing manner the radial outer rim and at least the peripheral rim region of the outside of the metal disk axially opposite the inside of the case.

4,326,643

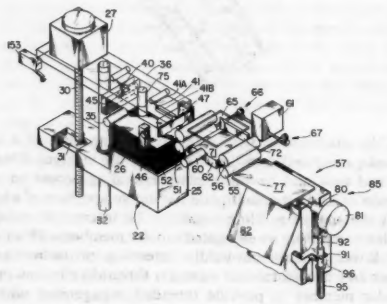
MAGNETIC TICKET DISPENSER

Robert T. Bayne, Carmel, and Phillip E. Shireman, Martinsville, both of Ind., assignors to Standard Change-Makers, Inc., Indianapolis, Ind.

Filed Sep. 4, 1979, Ser. No. 71,921

Int. Cl.³ B65H *3/14*

U.S. Cl. 221—13 **8 Claims**



1. Apparatus for dispensing rectangular tickets or the like comprising:

a container having a vertically extending opening therein with a rectangular horizontal cross section adapted to loosely receive a stack of tickets, said container having a top and a ticket passage slot adjacent thereto and leading from said opening to the outside of said container;

an elevator mounted for vertical movement in said container and adapted to support the stack of said tickets;

means for operating said elevator to position the uppermost ticket thereon slightly below said top;

said container having air jet orifices therein, a first of which is located in the container side wall on the opposite side of said container from said slot, a second of which is located in said container top on the opposite side of said container from said slot, and a third of which is located in said container top above said slot;

means for providing a blast of air under pressure through each of said orifices to move a ticket from the top of the stack of tickets out of said container through said slot;

two sets of two rollers, a first set of said rollers being mounted adjacent said slot to receive the tickets moving out of said slot;

a ticket guide plate fixedly mounted between the two sets of rollers;

means for rotating one roller of each set to move the tickets across and past said ticket guide plate through and from the first set of rollers to and through the second set of rollers;

a dump plate mounted adjacent said second set of roller; and

means for sensing the thickness of the tickets moving across said ticket guide plate and for controlling said dump plate to dump one direction or the other depending on the thickness of said tickets.

4,326,644

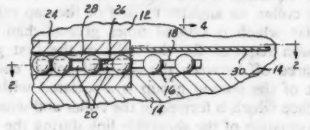
SAWTOOTH FEEDER WITH JAM PREVENTER

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Filed Dec. 28, 1979, Ser. No. 107,885

Int. Cl.³ B65H *3/32*

U.S. Cl. 221—263 **16 Claims**



1. Apparatus for feeding balls one by one from a bulk supply of balls including in combination, a container for holding said supply, said container having an inner wall and a base, means forming a passage of generally circular cross section leading outwardly through said wall, said passage having a diameter slightly greater than that of one of said balls, means forming a slot leading into said passage, the height of said slot being less than the diameter of one of said balls, a generally circular disk having peripheral teeth and intertooth spacings adapted to receive balls, said disk having a diameter at the locus of the ends of said teeth which is slightly less than the diameter of said inner wall, and being mounted in said container over said base with a peripheral portion thereof disposed in said slot, means for driving said disk to cause balls moved into said passage by said disk to be stripped from said disk by the portion of said slot forming means at the entry to said passage, and a blade carried by the wall of said reservoir and extending from a point adjacent to the top of said passage over a peripheral portion of said disk and radially inwardly for a distance greater than the diameter of a ball to ensure that a ball either fully enters or does not enter each of said intertooth spaces as it

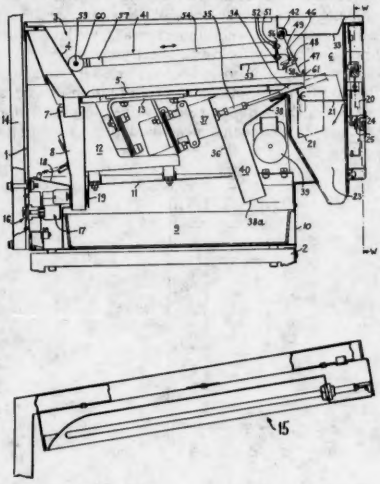
approaches said entry thus to prevent hang up of a ball between said disk and said passage forming means.

4,326,645

WEIGHING AND DISPENSING UNIT

Keith Faulkner, 24, Parkhill Rd., Bexley, Kent, England, and David E. Appleford, 7 Ayr Green, Rise Park, Romford, Essex, England

Filed Feb. 7, 1980, Ser. No. 119,301
Int. Cl.³ G01G *13/00*
U.S. Cl. 222—1 **17 Claims**



1. A unit for weighing and dispensing portions of fried potato products, from a supply of such products, said unit comprising a receptacle for receiving said supply, said receptacle having a bottom wall and a sloping rear wall which is inclined upwardly and outwardly away from the bottom wall of the receptacle, a dispensing chamber opening into said receptacle, weighing means including a releasable weighing platform hinged to a movable weighing support, vibrator means coupled to a bottom wall of said receptacle for feeding potato products from the receptacle, into the dispensing chamber and onto the weighing platform, an agitator for use in agitating the potato products whilst in the receptacle, means supporting the agitator in the receptacle in a position which is spaced from the bottom wall thereof, drive means for moving the agitator, including a drive spindle, means mounting said spindle for angular movement about a substantially horizontal axis and means connecting said spindle to said agitator, said agitator being provided with a member which engages with and moves up and down the said rear wall during movement of said agitator, the slope of said rear wall being matched to the angular movement of the spindle, said connecting means and said rear wall slope translating the angular movement of the spindle into reciprocating movement of the agitator in directions upwards and downwards and towards and away from the chamber opening.

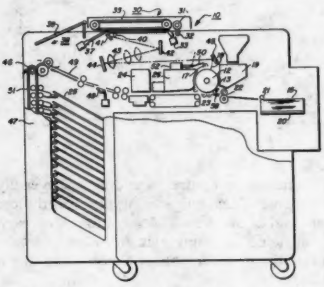
10. A method of weighing and dispensing portions of solid food products, which method comprises, supplying a load of solid food products to a receptacle having a bottom wall, oppositely facing side walls and a rear wall, vibrating said receptacle bottom wall to feed food products onto a hinged weighing platform disposed in a dispensing chamber opening into said receptacle, mechanically moving an agitator member disposed above said bottom wall and spaced from said side walls and having elongate spaced apart parallel sides extending generally in the direction of said bottom wall and towards said rear wall and being joined by an end element adjacent said rear wall and remote from the chamber opening, within the load of food products in said receptacle in the directions of upwards and downwards, and towards and away from said chamber opening to exert a supporting and lifting action on the load of food products above said agitator member, whereby to feed food products on said bottom wall below said agitator member to said dispensing chamber and to facilitate flow of food products from the load of chips towards the bottom wall, levelling the food products being fed as they pass from the receptacle into said dispensing chamber, and weighing the food products on the weighing platform such that the weighing platform hinges downwardly when a predetermined weight is reached to dispense a weighed portion of food products from the dispensing chamber.

4,326,646

AUTOMATIC DEVELOPMENT DISPENSER CONTROL

Lawrence P. Lavery, Fairport; David G. Wilcox, Macedon, and Dale C. Thomas, Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 11, 1979, Ser. No. 38,371
Int. Cl.³ B67D *5/08*
U.S. Cl. 222—56 **14 Claims**



1. A reproduction machine including
a photoreceptor,
means to form a latent image on the photoreceptor,
a developer for applying toner to the latent image,
a toner dispenser for providing toner to the developer,
a sensor producing a signal representative of developed toner mass,
and a means to activate the toner dispenser for predetermined time periods in response to the sensor signal, the means including a comparator and a digital to analog network, the sensor providing one input to the comparator representing a measurement of the developed toner mass on the photoreceptor and the digital to analog network providing a reference signal representing an undeveloped portion of the photoreceptor.

4,326,647

DEVICE FOR DISPENSING FLUENT MATERIAL FROM A COLLAPSIBLE CONTAINER

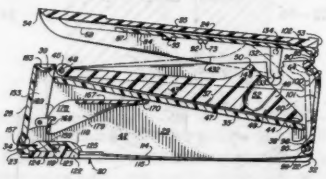
Daniel L. Pool, 5524 N. 39th Ave., Phoenix, Ariz. 85019

Filed May 22, 1980, Ser. No. 152,426
Int. Cl.³ B65D *35/28*
U.S. Cl. 222—103 **12 Claims**

1. A dispenser for holding a collapsible tube which tube includes a deformable body having a continuous side wall, a closed end, and an open end, a header wall closing the open end of the body and a discharge spout projecting from said header wall; said dispenser squeezing a fluent material from the tube, said dispenser comprising:
a housing having a forward end and a rearward end;
an anvil extending longitudinally within the housing for supporting said tube, said anvil having an inclined surface

for supporting the deformable body of the collapsible tube and having a rearward end and a forward end, said rearward end being elevated above said forward end;

lever means carried by said housing and opposing said anvil for progressively collapsing the deformable body of the collapsible tube from the closed end thereof and urging said fluent material from the discharge spout; said lever means including an elongate presser element angularly movable relative to the anvil, and an actuating element carried by the housing for urging the presser element toward the anvil; said presser element having a forward end and a rearward end, the rearward end being pivotally connected proximate the rearward end of the housing; said presser element having a surface opposing inclined surface of the anvil for bearing upon said deformable body and having a forward end approximately coincident with the forward end of the inclined surface and having a rearward end; said actuating element having a forward end and a rearward end, the forward end being pivotally connected proximate the forward of the housing; a contact element upstanding from the presser element for receiving the actuating element thereagainst, the contact



element including a ridge extending transversely of said presser element; said ridge being positioned closer to the forward end of the presser element than the rearward and contacting said actuating element at a position closer to the forward end of the presser element than the rearward end thereof;

an upright forward end wall mounted on the housing and spaced from the forward ends of the respective surfaces of the anvil and the presser element for receiving the header wall of the collapsible tube thereagainst, said forward end wall including an upper edge, a lower edge and an opening for receiving said discharge spout therethrough, said opening through the forward wall being elongated in the upright direction; pivot means proximate the lower edge of said forward end wall pivotally connecting said wall to said housing; and adjustment means for selectively varying the angular position of said forward end wall about said pivot means between a first position and a second position, said forward end wall residing farther from the ends of the respective surfaces of said anvil and said presser element in said first position than in said second position.

4,326,648

HOLDING DEVICE FOR HOLDING A DISPENSER CONTAINER

Lothar Kieber, Mülheim, Fed. Rep. of Germany, assignor to Deutsche Calypsolgesellschaft mbH & Co., Düsseldorf, Fed. Rep. of Germany

Filed Feb. 14, 1980, Ser. No. 121,610

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1979, 7904778[U]

Int. Cl.³ B67D *5/64*

U.S. Cl. 222—162 **5 Claims**

1. A device and container combination for removably holding a two-chamber dispensing container, having a dispensing valve with an outlet and a cap constituting a container cover having a peripheral flange adjacent an entrance of an opening in the cover, the latter being removably disposed selectively covering the valve and pluggable on a bottom of the container, respectively, in an operative position with the valve directed downwardly, comprising

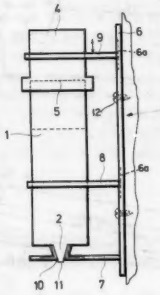
support means comprising a flat supporting arm formed with an opening means for securely holding the valve therein directed downwardly with the dispensing valve projecting through the opening such that the outlet of the valve is disposed under the support means,

first ring means for holding the container in a vertical position on said support means while permitting axial movement of the container,

said ring means for surrounding the container and being disposed at a distance above the support means,

a sheet metal support extending parallel to the container and rigidly connected to said support means, the latter extending perpendicularly from said sheet metal support,

a second ring means disposed above, spaced from and parallel to said first ring means and said bottom of said container when the latter is held inverted in said first ring means and in said opening means and then for holding said



container cover projecting upwardly through said second ring means in a lower position of said cover relative to said second ring means plugged on the container bottom and selectively for holding said cover in an upper position thereof relative to said second ring means spaced from said bottom of said container, said second ring means and said cover being spaced above the bottom of said container and above said first ring means in said upper position of said cover by a distance, such that the container only then can be removed from said first ring means and said opening means and such that said cover can only be inserted into said second ring means from below with said flange facing down prior to insertion of said container in said first ring means and in said opening means and such that said cover can be held in said upper position in said second ring means until said container has been inserted through said first ring means and into said opening means,

said first and said second ring means being connected to said sheet metal support extending perpendicularly therefrom.

4,326,649

DUST COVER WITH ASSURANCE LUG

Samuel F. Marino, Oak Park, and Daniel P. Hidding, Barrington, both of Ill., assignors to Hunt-Wesson Foods, Inc., Fullerton, Calif.

Filed Dec. 19, 1980, Ser. No. 218,432

Int. Cl.³ B67D *5/06*; B65D *43/04*

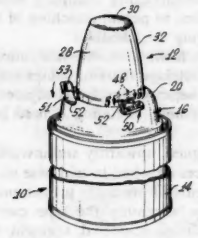
U.S. Cl. 222—182 **19 Claims**

1. For a container having a top with a rim thereon, a dust cover that provides a positive indication that it has not been removed and that no portion of the contents of said container has been dispensed, said cover comprising:

a cup-shaped body to be placed on said top in an inverted position, said body having a circular bottom edge for engagement with said top;

a plurality of lugs to engage said rim on said top thereby retaining said cover on said container, there being an assurance lug, a release lug and at least one fixed lug;

actuator means integrally formed with said cover for disengaging said release lug from said rim without permanently deforming said cover; and



tab means for connecting said assurance lug to said body and for disengaging said assurance lug from said rim upon permanent deformation thereof, said tab means being integrally formed with said body.

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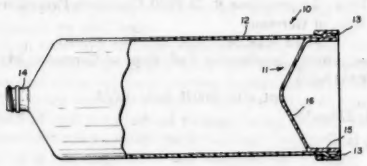
DISPENSING SYSTEM USING CARTRIDGE WITH INTERLOCKING PLUNGER

Dick T. Van Manen, Canandaigua, N.Y., assignor to Voplex Corporation, Pittsford, N.Y.

Continuation-in-part of Ser. No. 92,440, Nov. 7, 1979. This application Mar. 24, 1980, Ser. No. 132,800

Int. Cl.³ B67D *5/42*

U.S. Cl. 222—386 **8 Claims**



1. A dispensing system using a molded resin cartridge with a generally cylindrical wall having an open rear end and a molded resin plunger with a skirt that fits the inside of said cylindrical wall so said plunger can be seated in a rear region of said cartridge to seal said open rear end after said cartridge is filled, said plunger being shaped to receive a pusher that engages and advances said plunger into said cartridge while a holder holds said cartridge during said plunger advance to dispense the contents of said cartridge, said dispensing system comprising:

a. said cartridge having an interlock surface spaced a short distance forward from said open rear end;

b. said interlock surface extending outward from the outer surface of said cylindrical wall;

c. said interlock surface extending around said cartridge wall along the intersection of said wall and a plane perpendicular to the axis of said cartridge forward from said open rear end;

d. said interlock surface facing forward away from said open rear end;

e. a cylindrical region of said plunger skirt supportively fitting against the inside of said cylindrical wall substantially forward of said interlock surface when said plunger is seated in said cartridge so said plane perpendicular to said cartridge axis intersects a rear region of said plunger;

f. a central region of said plunger extending across said cartridge when said plunger is seated in said cartridge being joined to a forward region of said skirt fitting against said cylindrical wall and located substantially forward of said plane perpendicular to said cartridge axis;

g. a molded resin locking ring formed as a generally cylindrical sleeve extending around said cartridge wall;

h. said sleeve having an inner surface extending rearward of said interlock surface;

i. said sleeve having a hook surface extending inward from said inner surface of said sleeve;

j. said hook surface facing rearward toward said open rear end of said cartridge;

k. said hook surface extending around said sleeve and along said intersection to hook over said interlock surface and hold said sleeve against movement toward said rear end of said cartridge;

l. said locking ring having a radial wall extending inward from said sleeve over said rear end of said cartridge wall; and

m. said radial wall being arranged to prevent rearward movement of said plunger out of said rear end of said cartridge so said plunger and said locking ring cooperate to improve the seal and security of said cartridge.

4,326,651

APERTURED PLATE WITH ADJUSTABLE-CONSTRICTION MEMBER FOR PROVIDING SHIFTABLE BOTTOM WALL OF HOPPER FOR GRANULAR MATERIAL THAT IS JUXTAPOSED UPON A PLURALITY OF METERING COMPARTMENTS

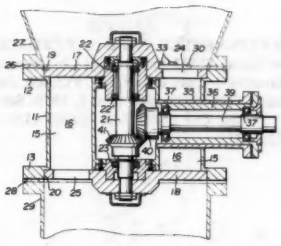
Makoto Sabase, Higashimurayama, and Mario Sakaitani, Chiba, both of Japan, assignors to Matsushita Industry Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1980, Ser. No. 164,767

Claims priority, application Japan, Jul. 2, 1979, 54-89684[U]

Int. Cl.³ G01F *11/28*

U.S. Cl. 222—439 **2 Claims**



1. In an apparatus for quantitatively metering granular material such as powders and particles of synthetic resin for use as starting material, pigments, cement, fertilizers and foodstuffs, comprising a main body having a plurality of independent stationary metering compartments having upper and lower open ends and disposed radially around an axis, and top and bottom end plates adapted for covering the upper and lower open ends of the compartments and being rotatable about said axis, the top plate having a hole adapted for being brought into alignment with the upper open end of each compartment as this end plate is rotated, the bottom end plate having a hole so positioned as is not aligned with the hole of the top end plate and being adapted for being brought into alignment with the lower open end of each compartment as this end plate is rotated, so that, with the rotation of these end plates, a material requiring metering is fed into the compartments, one compartment after another, through the hole of the top end plate, and the metered material contained in these compartments is allowed to flow out through the hole of the bottom end plate from one compartment after another, the improvement comprising a projectable lug provided on the top end plate so as to slidably project beyond the trailing edge of the hole thereof

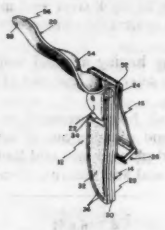
toward the leading edge of this hole to limit the degree of area of this hole and being adapted to be maintained at any desired degree of projection.

4,326,652

KNIFE SHEATH STRUCTURE

Charles K. Fortenberry, 3112 Vandenberg, Wichita, Kans. 67210

Filed Jan. 26, 1981, Ser. No. 228,140
Int. Cl.³ B26B *29/02*
U.S. Cl. 224—232 **6 Claims**



1. A Knife Sheath Structure adapted to be connected to a person's belt member or the like, comprising:

(a) a main knife support assembly adapted to receive and support a knife member therein;

(b) a vertical support assembly secured to said main knife support assembly and connectable to the belt member;

(c) a cover assembly secured to said main knife support assembly and operable to enclose and cover a handle portion of the knife member; and

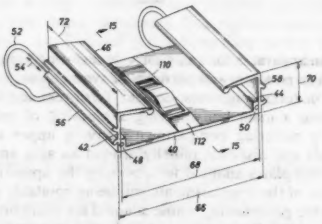
(d) a connector assembly connected to said vertical support assembly to receive a portion of said main knife support assembly and said cover assembly therein to prevent vertical and lateral movement of the knife member therefrom.

4,326,653

VISOR-CONNECTED TAPE CARTRIDGE HOLDER

H. Spencer Stone, 11327 Piney Point Cir., Houston, Tex. 77024

Continuation-in-part of Ser. No. 913,806, Jun. 8, 1978, abandoned. This application Oct. 1, 1979, Ser. No. 80,935
Int. Cl.³ B60R *7/08;* **B65D** *85/67*
U.S. Cl. 224—312 **5 Claims**



1. A holder for attaching to a vehicle sun visor and holding at least one tape cartridge therein, comprising;

a plastic clamp segment for lying adjacent the top of the visor, said segment including;

a base portion for lying along the visor,

oppositely aligned, upwardly and inwardly turned wedging end pieces attached to said base portion, the dimension between said inwardly turned end pieces and said base portion accepting the tape cartridge, wherein said base portion includes at least two raised channels attached to said base portion within the dimension between said end pieces for supporting the tape cartridge within the holder and providing a reduced friction surface, wherein at least one of said raised channels includes an elongate opening therethrough, and including a wire press fitted into said opening for elongate adjustable positioning, said wire being curved to overlappingly and resiliently clamp onto one of the edges of the visor, and

universally accommodating clamping means connected to said base portion to permit attaching of the holder to sun visors of varying thicknesses.

5. A holder for attaching to a vehicle sun visor and holding at least one tape cartridge therein, comprising;

a plastic clamp segment for lying adjacent the top of the visor, said segment including a base portion for lying along the visor,

oppositely aligned, upwardly and inwardly turned wedging end pieces attached to said base portion, the dimension between said inwardly turned end pieces and said base portion accepting the tape cartridge, said base portion includes a slotted segment having securing means therein,

resilient means secured by said securing means and depressingly operating within said slotted segment and having a raised portion that projects above said slotted segment for urging the cartridge against the end pieces, said slotted segment including a ramp on the entry of said base portion as a convenience guide to assist the entry of the cartridge into the holder, and

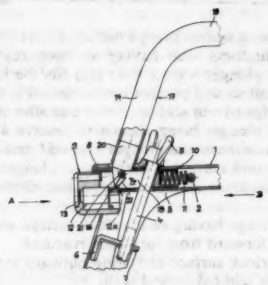
universally accommodating clamping means connected to said base portion to permit attaching of the holder to sun visors of varying thicknesses.

4,326,654

MOTOR VEHICLE ROOF CARRIER FOR THE AFFIXATION OF SKIS AND OTHER OBJECTS TO BE TRANSPORTED

Dieter Frey, Angerstrasse 9, D-8100 Garmisch-Partenkirchen, Fed. Rep. of Germany

Filed May 30, 1979, Ser. No. 43,910
Claims priority, application Fed. Rep. of Germany, May 30, 1978, 7816134[u]
Int. Cl.³ B60R *9/04, 9/12*
U.S. Cl. 224—315 **5 Claims**



1. A device for supporting skis or other objects on the roof of a motor vehicle, comprising a tubular carrier having an end portion; means for clamping said carrier to the roof of the vehicle; latching means including a portion extending into the end portion of said carrier and having an elongated slot, said latching means further including a pin in said slot and said clamping means including a member traversing said end portion of said carrier and extending with clearance through said slot so that said latching means is movable lengthwise of said carrier; abutment means provided in said carrier; resilient means interposed between said abutment means and said portion of said latching mans to yieldably oppose the movement of

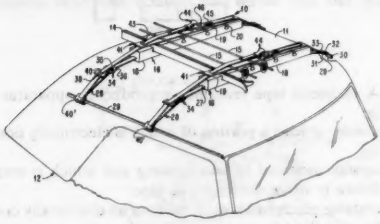
said latching means in one direction; a securing lever having a first portion remote from said end portion of said carrier and a second portion insertable into said slot and engageable with said pin against the opposition of said resilient means; means for movably connecting said first portion of said lever to said carrier; and locking means provided on said latching means and operable to hold said second portion of said lever against disengagement from said pin.

4,326,655

VEHICLE ROOF CARRIER FOR SKIS AND SKI POLES

Walter A. Gradek, and John W. Boggs, both of Lexington, Ky., assignors to Foam Design, Incorporated, Lexington, Ky.

Filed Jan. 30, 1981, Ser. No. 229,959
Int. Cl.[3] B60R 9/12
U.S. Cl. 224—324 31 Claims



1. A carrier for supporting skis on a vehicle roof including:
a body of resilient material;
said body having a bottom wall for engaging the vehicle roof on which said body is to be mounted transversely;
said body having an upper wall substantially parallel to said bottom wall;
said upper wall having a plurality of substantially parallel longitudinal passages therein to receive skis therein for support by said body;
each of said longitudinal passages having a first cross sectional portion communicating with said upper wall and a second cross sectional portion communicating with said first cross sectional portion, said first cross sectional portion of said longitudinal passage being smaller than said second cross sectional portion of said longitudinal passage to grip skis disposed in said longitudinal passage;
and said body having a transverse passage extending transversely to said longitudinal passages to receive means to releasably secure said body to the vehicle on which said body is to be mounted, said transverse passage being disposed beneath the bottom of each of said longitudinal passages.

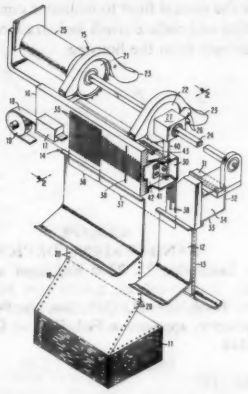
4,326,656

EVACUATED PRINTING PLATEN

Floyd A. Gregory, Binghamton; Donald F. Manning, Endicott; William Oranchak, Johnson City, all of N.Y., and Joseph J. Student, deceased, late of Apalachin, N.Y. (by Sophie A. Student, administratrix), assignors to International Business Machines, Armonk, N.Y.

Filed Jun. 25, 1980, Ser. No. 162,996
Int. Cl.[3] B65H 17/38, 17/44
U.S. Cl. 226—59 4 Claims

1. Apparatus for positioning a web of recording medium comprising:
tractor means engaging opposite edges of said web for moving said web;
a chamber extending across the width of said web;
a face plate serving as one wall of said chamber adjacent said web, said face plate having a plurality of parallel slots extending longitudinally in the direction of motion of said web; and
means for evacuating air from said chamber to thereby attract said web against said face plate to provide frictional restraint during the motion of said web, with said



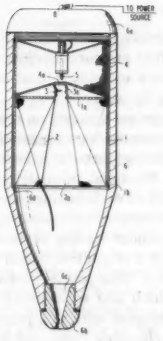
slots being formed to provide decreasing frictional restraints from one edge of said web to the other.

4,326,657

OPTICAL FIBER DISPENSER

John B. Arpin, Ocean, and Sam Di Vita, West Long Branch, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 19, 1980, Ser. No. 150,765
Int. Cl.[3] B65H 17/32; F42B 13/56
U.S. Cl. 226—97 8 Claims



1. An optical fiber dispenser adapted for mounting on a missile to be directed to a remote location from a first location for establishing a communication link between said locations comprising a housing, an orifice provided at one end of said housing, a supply of optical communication fiber mounted in said housing and wound about a central open area, the free end of a strand from the supply of optical fiber extending through said orifice and adapted to be secured externally at said first location while the supply of fiber in said housing is unwound and payed out through said orifice by movement of said missile toward said remote location, a source of pressurized gas mounted in said housing adjacent said supply of optical fiber at an end of said central area spaced from said orifice, and valve means operatively connected to said pressurized gas source for releasing the gas from said source upon lift-off of said missile allowing the gas to flow through said central area and supply

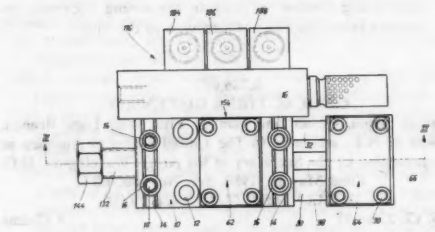
of optical fiber and through said orifice around the strand of optical fiber as the fiber is unwound and payed out through said orifice, the gas escaping through said orifice forming an air bearing for the optical fiber to minimize contact with the sides of said orifice and reduce stress and strain on the optical fiber as it is dispensed from the housing.

4,326,658

BAND-FEEDING DEVICE

Kurt Stoll, Lenzhalde 72, 7300 Esslingen a.N., Fed. Rep. of Germany

Filed Nov. 21, 1979, Ser. No. 96,277
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851746
Int. Cl.³ B65H 17/26
U.S. Cl. 226—141 17 Claims



1. In a band-feeding device comprising:

a stationary first pressure medium operated clamping claw for selectively securing a band of material which is to be moved step by step;

two guide members secured on the first clamping claw;

a second pressure medium operated clamping claw movable on the guide members for selectively securing a different section of the band of material, said first and second clamping claws each having a servomotor and a pressure medium connection for operating same;

a working cylinder having relatively movable parts each connected to a respective one of the clamping claws; and

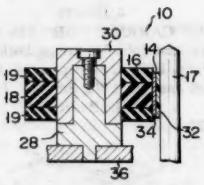
a longitudinally changeable pressure medium connection through which said servomotor of the second clamping claw is connected with said pressure medium connection of the first clamping claw, said longitudinally changeable pressure connection having a plunge piston provided with a through-going pressure medium channel, said plunge piston being carried by one said clamping claw and running in a blind hole of the other said clamping claw and being sealed against leakage of pressure medium, the improvement comprised in that said guide members are guide rods and the servomotor of the second clamping claw is a conventional single-acting servomotor, both said guide rods being carried by the stationary first clamping claw, one said guide rod forming said plunge piston provided with the through-going pressure medium channel, said one guide rod running with its free end section sealed against leakage of pressure medium in a blind hole in the second clamping claw, the other guide rod being longer in axial dimension than said one guide rod, and such that said other guide rod always extends entirely through a through hole in the second clamping claw.

4,326,659

MAGNETIC RECORDING-REPRODUCING APPARATUS

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1980, Ser. No. 133,814
Claims priority, application Japan, Apr. 4, 1979, 54-40492
Int. Cl.³ B65H 17/20
U.S. Cl. 226—190 4 Claims



1. A magnetic tape recording-reproducing apparatus comprising:

a housing at least a portion of which is electrically conducting;

a capstan mounted to said housing and which is rotatably driven to drive the magnetic tape;

a rotatable pinch roller shaft made of an electrically conductive metal;

a pinch roller bearing made of an electrically conductive metal for rotatably mounting said pinch roller shaft to said electrically conducting housing portion and for electrically connecting said pinch roller shaft to said electrically conducting housing portion; and

a pinch roller of resilient material mounted on said pinch roller shaft and adapted to tightly contact a magnetic coating surface of a magnetic tape when the magnetic tape is pinched between the pinch roller and the capstan, at least a portion of the pinch roller which contacts the magnetic coating surface of the magnetic tape being made of a resilient electrically conductive rubber which has a substantial thickness in the radial direction of the pinch roller shaft and resiliently yielding when the pinch roller is pressed against the capstan with the magnetic tape therebetween, the electrically conductive rubber portion extending to and contacting the pinch roller shaft;

whereby electrostatic charge is conducted from the magnetic coating of the magnetic tape to the housing of the apparatus through the electrically conductive rubber portion of the pinch roller, the pinch roller shaft and the pinch roller bearing.

4,326,660

COMBINED CASSETTE TAPE GUIDE AND TAPE STRIPPER

Anthony Scianna, Sr., Morton Grove, and Frank J. Gordon, Chicago, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed May 8, 1980, Ser. No. 147,792
Int. Cl.³ B65H 17/20
U.S. Cl. 226—190 12 Claims

1. An improved cassette tape player comprising:

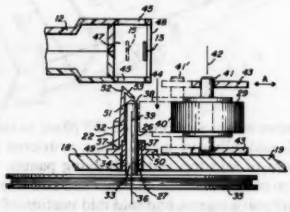
a tape player frame;

at least one capstan shaft means rotatable with respect to said frame about an axis for providing tape driving movement to a tape to be inserted into said tape player, said capstan shaft means having a free upstanding end portion, an opposite end portion mounted to said frame, and an engaging portion between said end portions for drivingly engaging the inserted tape;

at least one pressure roller means mounted to said frame and freely rotatable about an axis parallel to said capstan shaft axis, said pressure roller means disposed on one side of

said capstan shaft axis and movable with respect to said capstan shaft means between a first position wherein said capstan shaft means and said pressure roller means are spaced apart and a second position wherein said pressure roller effectively contacts said tape-engag-portion of said capstan shaft means, said pressure roller means selectively frictionally captivating an inserted tape between said pressure roller means and said capstan shaft means to provide driving movement to said inserted tape;

tape guide means mounted to said frame adjacent to said capstan shaft means, said tape guide means generally extending from said mounted end portion of said capstan shaft means to said free upstanding end portion of said capstan shaft means with said tape guide means including a first end portion extending beyond said free upstanding capstan shaft end portion, said guide first end portion



effectively forming a tape guide plane beyond said capstan shaft free end portion which is inclined with respect to said capstan axis, and wherein during insertion of tape over said free upstanding end portion of said capstan shaft means said first end portion of said tape guide means positively positions inserted tape on said one side of said capstan shaft between said capstan shaft axis and said pressure roller axis with said capstan shaft means and said pressure roller means in said first position; and

movable positioning means coupled to said tape player frame for receiving a cassette housing having tape within and inserting both a portion of the cassette carrier and the tape within the cassette carrier over both said free upstanding end portion of said capstan shaft means and said tape guide means first end portion with said tape within said cassette carrier being positioned between said capstan shaft means and said pressure roller means.

4,326,661

MAGAZINE FOR FEEDING HEADED FASTENERS INTO A DRIVING APPARATUS

Werner Maurer, Nuertingen, and Gerhard Farian, Grossbettlingen, both of Fed. Rep. of Germany, assignors to Karl M. Reich, Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

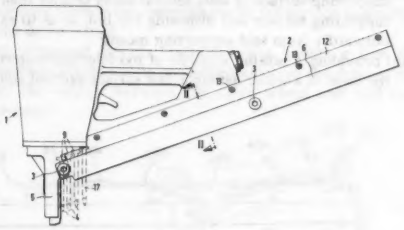
Filed Apr. 14, 1980, Ser. No. 140,571

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 2915994

Int. Cl.³ B25C *5/16*

U.S. Cl. 227—120 **6 Claims**

1. A magazine for feeding fasteners having heads into a driving apparatus for the fasteners, comprising two separate, profiled, channel members with inwardly facing sides defining a travel path for the fasteners, means releasably connecting said channel members to each other to form the magazine, spacer means of given width exchangeably interposed between said two channel members for defining a width for said travel path, and longitudinal support means made of steel wire secured to said inwardly facing sides of said channel members for supporting the heads of said fasteners by tangential contact



with the steel wire minimizing the friction of the fasteners sliding along said longitudinal steel wire support means.

4,326,662

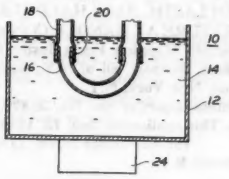
PROCESS OF ULTRASONICALLY SOLDERING DRAWN ALUMINUM TUBING PRODUCTS

Bruce E. Anderson, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 2, 1980, Ser. No. 183,355

Int. Cl.³ B23K *1/06, 31/06*

U.S. Cl. 228—111 **17 Claims**



1. In a process wherein a socket-type tube joint comprising an aluminum tubular member is joined by fluxless ultrasonic soldering and wherein said aluminum tubular member is provided from a coilable tube produced by drawing elongate hollow aluminum stock through a sequence of drawing die stages of progressively diminishing size with floating mandrels therein to progressively reduce the diameter and wall thickness of the aluminum stock by cold working such stock between said dies and floating mandrels to provide said aluminum coilable tube in work hardened temper, wherein the improvement comprises pulling said coilable aluminum tube in work hardened temper through a burnishing die which concentrates its work effects substantially in the outside surface region of said tube thereby to precondition said outside the surface for said ultrasonic fluxless soldering.

4,326,663

PYROELECTRIC DETECTOR

Friedrich H. Oettel, Daytona Beach, Fla., assignor to Eltec Instruments, Inc., Daytona Beach, Fla.

Continuation of Ser. No. 925,991, Jul. 10, 1978, Pat. No. 4,218,620. This application Feb. 4, 1980, Ser. No. 118,796

The portion of the term of this patent subsequent to Aug. 19, 1997, has been disclaimed.

Int. Cl.³ H01L *21/58*

U.S. Cl. 228—123 **6 Claims**

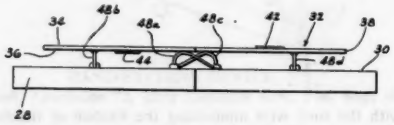
1. A method of making a pyroelectric detector comprising the steps of:

(a) providing a supporting means having a supporting surface;

(b) providing at least one elongated link element having a

shape like an arch on said supporting means by securing the two ends of the arch-like link to spaced locations on said supporting surface in a manner providing an area of contact between each end of said link element and said supporting surface at least several times smaller than said supporting surface and disposing the link so as to extend outwardly from said supporting means;

(c) providing a sensing element of pyroelectric material in the form of a wafer having a first surface portion adapted



to be disposed toward incident radiant energy, another surface portion and means on said sensing element for collecting electric charge indicative of energy absorbed by said sensing element; and

(d) placing said sensing element on said link and securing said other surface portion of said sensing element to the outer portion of said link whereby said sensing element is held by said link in spaced relation to said supporting means.

4,326,664

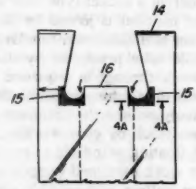
THERMOPLASTIC BAGS HAVING STRESS RELIEF FEATURE AT HANDLE CONNECTION

Gordon L. Benoit, Macedon; Franz Bustin, Rochester, and Jack J. Donaldson, Fairport, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 20,899, Mar. 15, 1979, abandoned. This application Jun. 13, 1980, Ser. No. 159,971

Int. Cl.³ B65D *33/06, 33/02*

U.S. Cl. 229—54 R **11 Claims**



1. A thermoplastic bag structure having front and rear walls, a pair of spaced upwardly extending handle members formed integrally with said front and rear walls, an open mouth portion between said handles, and a plurality of upwardly extending pleats formed in said front and rear walls, said pleats being located at least transverse the lower inner portion of each of said handle members and said mouth portions immediately adjacent said lower inner portions of said handle members.

4,326,665

GIFT PACKAGE SLEEVE

Raymond G. Scott, Oak Brook, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed May 19, 1980, Ser. No. 151,356

Int. Cl.³ B65D *75/02, 75/54*

U.S. Cl. 229—87 R **4 Claims**

1. A container having an integral greeting card thereon, said container comprising:

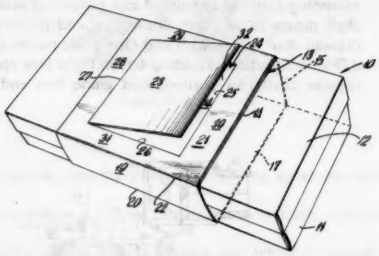
(a) a bottom panel;

(b) a pair of side panels connected to said bottom panel along opposed parallel fold lines;

(c) an underlying panel connected to one of said side panels along a fold line parallel to said opposed parallel fold lines;

(d) a top panel connected to the other of said side panels along a fold line parallel to said opposed parallel fold lines, said top panel overlying said underlying panel;

(e) means forming a hinged flap integrally in an internal portion of said top panel, said flap overlying a mid portion of said underlying panel; and



(f) adhesive means securing said top panel to said underlying panel, said adhesive means being restricted to peripheral portions of said top and underlying panels, and said mid portion of said underlying panel and said flap being free of said adhesive means, and said mid portion of said underlying panel and said flap combining to form said integral greeting card on said container in which said flap can be folded back from said mid portion of said underlying panel to expose said mid portion of said underlying panel to view a message written thereon.

4,326,666

CENTRIFUGAL TYPE COUNTERFLOW CONTACT APPARATUS

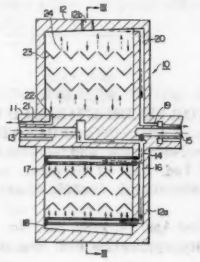
Kiyoshi Fujiwara; Katsuaki Nagatomo; Shoji Yoshinaga; Zensuke Tamura; Fumio Shibata, and Hiroshi Kanekiyo, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 9, 1979, Ser. No. 37,996

Claims priority, application Japan, Jul. 5, 1978, 53-80902

Int. Cl.³ B04B *15/02, 5/06*

U.S. Cl. 233—15 **12 Claims**



1. A centrifugal type counterflow contact apparatus comprising a rotary body integrally mounted on a rotary shaft, means for introducing a light liquid into said rotary body about the periphery thereof, means for introducing a heavy liquid about the center portion of the rotary body, means for discharging said heavy liquid from the periphery of said rotary body, means for discharging said light liquid from a center portion of said rotary body, and means for causing a counterflow contacting of the light and heavy liquids comprising:

a plurality of V-shaped ring members disposed within said

rotary body and being spaced from one another axially of the rotary body so as to define slits between respective adjacent ring members, each of said ring members having a V-shaped cross sectional configuration which opens radially outwardly with respect to said rotary shaft.

4,326,667

AUTOMATIC TEMPERATURE ADJUSTING TYPE AIR CONDITIONER

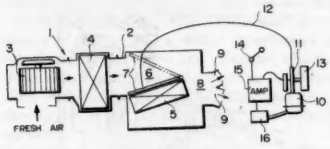
Yukiho Murata, Yokohama, and Yasushi Inoshita, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Tokyo, Japan

Filed Dec. 18, 1980, Ser. No. 217,750

Claims priority, application Japan, Dec. 25, 1979, 54-180105[U]

Int. Cl.³ B60H *1/12*

U.S. Cl. 237—12.3 A **5 Claims**



1. An air conditioner of automatic temperature adjusting type for an automotive vehicle having a mechanism for adjusting an angularly moved air mixing door and air flow rate of a fan independently of each other, which comprises:

(a) linearly actuating means;

(b) means for adjusting air flow rate of the fan coupled to said linearly actuating means;

(c) a pinion pivotally mounted on said linearly actuating means so as to be rotatable about an axis substantially orthogonal to the direction in which said linearly actuating means moves;

(d) a fixed rack meshed with said pinion throughout substantially whole range of the movement of said linearly actuating means; and

(e) a movable rack meshed with said pinion and connected to the air mixing door; and

(f) means for substantially disabling the movement of said movable rack near the both end positions of said fixed rack,

whereby said movable rack does not move when said pinion is rotatingly moved over each of end portions of said fixed rack, whereas over an intermediate portion of the movement and said linearly actuating means said movable rack moves through a distance corresponding substantially to the whole adjusting range of the air mixing door.

4,326,668

LOW COST VEHICLE TRACTION DEVICE EMPLOYING PIVOTALLY MOUNTED ANCHORING MEANS

Thorvald G. Granryd, 825 N. Sheridan, Lake Forest, Ill. 60045

Continuation-in-part of Ser. No. 253, Feb. 5, 1979, Pat. No. 4,225,082. This application Apr. 14, 1980, Ser. No. 140,176

Claims priority, application Australia, Jun. 19, 1979, PD9241

Int. Cl.³ B60C *27/00*

U.S. Cl. 238—14 **12 Claims**

1. An assembly for providing a traction surface under the drive wheel of a vehicle comprising

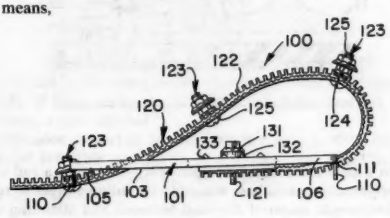
base means adapted to be positioned adjacent to a drive wheel of a vehicle,

said base means including cleat means adapted to engage the surface supporting the drive wheel of the vehicle and anchor said base means,

elongated flexible traction means having a first end affixed to said base means,

said elongated traction means including a first surface having a friction enhancing surface for contacting with the driving wheel and a second surface having a substantially smooth surface for contacting with the surface supporting the drive wheel,

said elongated flexible traction means having a free end portion adapted to be positioned adjacent the drive wheel of the vehicle between the drive wheel and said base means,



said elongated flexible traction means being looped upon itself between the first end affixed to said base means and the drive wheel of the vehicle through at least a portion of said base means during positioning of said free end portion adjacent the drive wheel, and

said elongated flexible traction means forming a traction surface to extricate the vehicle as said free end portion is drawn beneath the drive wheel of the vehicle with said first friction enhancing surface in engagement therewith and said second substantially smooth surface passing over the vehicle supporting surface during rotation of the drive wheel while said first end portion is anchored against movement by said base means.

4,326,669

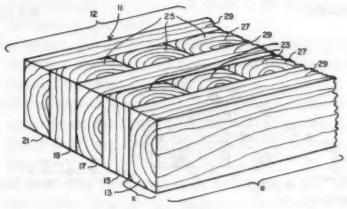
LAMINATED WOODEN RAILROAD CROSSITE HAVING EXPOSED END-GRAIN FORMING PART OF THE LOAD BEARING SURFACE

Roy H. Moult, Murrysville, and Craig R. McIntyre, Export, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jun. 9, 1978, Ser. No. 914,180

Int. Cl.³ E01B *3/02*

U.S. Cl. 238—36 **7 Claims**

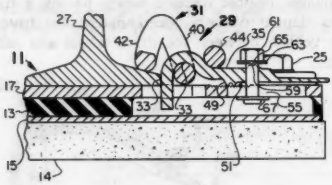


1. A laminated railroad crosstie comprised of at least one lamina including a plurality of wooden stubs oriented such that at least one of said stubs extends the full height of the crosstie, and will receive each imparted load, said load being imparted to said stubs end surface housing said stubs end grain.

4,326,670
ADJUSTABLE SPRING CLIP

James W. Sherrick, Edinboro, and Chris E. Casbohm, Conneautville, both of Pa., assignors to Lord Corporation, Erie, Pa.

Filed Jun. 23, 1980, Ser. No. 162,238
Int. Cl.[3] E01B *9/46, 9/30*
U.S. Cl. 238—341 9 Claims

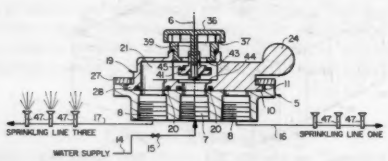


1. In a base assembly for removeably mounting a rail on a support structure, said base assembly including a layer of resilient elastomeric material disposed between and attaching to a base plate and a top plate, said base assembly having anchoring means adjacent each end for attaching said base assembly in a fixed position to said support structure, said rail being positioned on said top plate and being secured thereto by a pair of resilient rail clips disposed on opposite sides of said rail, said rail clips having an anchoring section and first and second bearing sections, said top plate having an elongated cut-out on opposite sides of said rail, the improvement comprising laterally adjustable rail clip fastening means, said fastening means including a pair of sections of rigid material having a bearing surface at one end and a straight portion at the opposite end with a curved portion therebetween, said bearing surface and straight portion being generally perpendicular to one another, said bearing surface being formed with a pair of slots corresponding to the thickness of said top plate, one of said sections of rigid material being inserted within each of said elongated cut-outs in said top plate on opposite sides of said rail such that said slots in said bearing surface engage said top plate, said sections of rigid material being laterally moveable along said elongated cut-outs to position said bearing surface in abutment with said rail whereby said anchoring section of each of said rail clips is inserted within said curved portion of said sections of rigid material on each side of said rail to securely hold said rail clips in a position wherein said first bearing section contacts said rail and prevents movement of said rail relative to said base assembly.

4,326,671
ANTI-SIPHON SELECTOR VALVE

Robert P. Goguen, 350 Laurelwood Rd., Santa Clara, Calif. 95050

Filed Feb. 5, 1980, Ser. No. 118,733
Int. Cl.[3] F16K *24/02*
U.S. Cl. 239—66 8 Claims

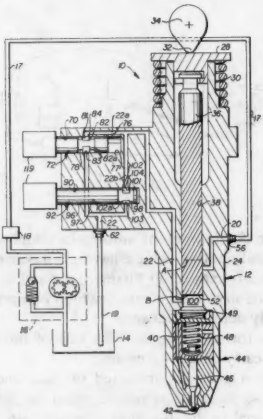


1. An anti-siphon, selector valve for directing incoming fluid through one of a plurality of output ports, comprising:
(a) a valve body having therein an input port and a plurality of output ports disposed about the input port;
(b) a conduit member rotatably mounted on the valve body and selectively connectable between the input port and one of the output ports so that incoming fluid entering the input port is directed out one of the output ports; and
(c) anti-siphon valve means mounted in the conduit member for venting the output ports to the atmosphere through the conduit when the pressure of fluid in the valve is substantially atmospheric.

4,326,672
ROTARY FUEL INJECTION APPARATUS

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 88,723, which matured from PCT/US79/00587, filed Aug. 8, 1979, 102(e) date Aug. 8, 1979, § 371 date Aug. 8, 1979, abandoned. This application Feb. 13, 1981, Ser. No. 234,085
Int. Cl.[3] F02M *47/02, 55/02, 61/04, 63/04*
U.S. Cl. 239—91 24 Claims

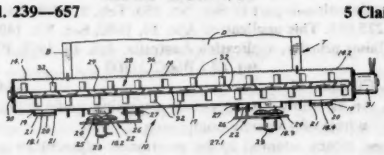


1. A fuel injection apparatus (**10**) comprising:
a housing (**24**), said housing (**24**) having a plunger bore (**38**);
a plunger (**36**) reciprocally mounted in said plunger bore (**38**) to define a pumping cavity (**100**) therein;
means (**20,22**) for conducting fuel to and from said plunger bore (**38**) and to the pumping cavity (**100**) defined therein;
means (**72,92**) for starting and stopping injection of said fuel, said means being first and second valves (**72,92**), said first and second valves (**72,92**) being fluidly interconnected and said first and second valves (**72,92**) being fluidly connected to said plunger bore (**38**); and
means (**119**) for continuously rotating said first and second valves (**72,92**) during sequential and repeated starting and stopping of said injection of said fuel.

4,326,673
AGGREGATE DISTRIBUTOR

Anthony A. Thene, 517 Wilson Ave. SE., St. Cloud, Minn. 56301

Filed Jul. 9, 1979, Ser. No. 56,048
Int. Cl.[3] E01C *19/20*
U.S. Cl. 239—657 5 Claims



1. A truck dump box-mounted distributor supplying loose aggregate to spreading spinners, comprising
an elongate open-topped housing for attachment across the

end of such a dump box to extend transversely of the direction of travel of the truck for receiving such aggregate in both chunks and loose particles, the housing having elongate bottom and upright sidewalls in stationary relation to each other to receive and confine such aggregate, the bottom wall with a multiplicity of discharge ports therein through which the aggregate may be dropped onto such a spreading spinner, the housing having gate means at said discharge ports for selectively opening and closing the ports and thereby changing the location at which spreading of the aggregate occurs,

an elongate aggregate conveying, mixing and agitating rotor in the housing and extending along the discharge ports and substantially to the ends of the housing, the rotor including a shaft rotatably mounted on the housing, and means revolving the shaft, and a multiplicity of aggregate propelling and chunk breaking vanes protruding outwardly from the shaft and being oriented obliquely of the shaft axis to propel aggregate along the housing and toward open discharge ports, and the vanes having means variably securing the vanes to the shaft at any of a multiplicity of pitches and at either direction of slope facilitating changing the speed and direction of aggregate movement along portions of the housing as different combinations of discharge ports are opened and also changing the thoroughness of breaking aggregate chunks into loose particles,

and aggregate spreading means demountably suspended on the housing beneath one of the discharge ports and movable to a location beneath another of the ports.

4,326,674

DEVICE FOR THE HOMOGENIZATION OF MATERIAL TO BE CRUSHED

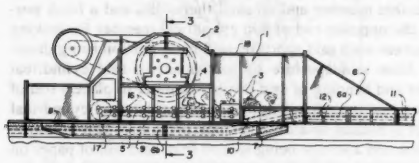
Ernst Braun, and Gert Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach & Braun, Fed. Rep. of Germany

Filed Jan. 31, 1980, Ser. No. 117,120

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1979, 2904694

Int. Cl.³ B02C *13/286*

U.S. Cl. 241—35 **12 Claims**



1. In a device for sizing breakable material, the materials being composed of a coarse material and a fine material, particularly coal, to a substantially uniform size, of the type having a crushing plate, a rollcrusher for roll crushing the coarse material on the crusher plate, the crusher plate being mounted below the roll crusher at a level leaving a predetermined clearance for the material to be crushed and a conveyor for feeding the material to be crushed through the crushing plate, in combination therewith, the improvement wherein the conveyor is mounted to initially run at the level of the crusher plate, is then deflected downwardly in a deflection area short of the crusher plate to run below the level of the crusher plate, and further comprising grading means in the deflection area between the conveyor and the crusher plate for separating the coarse material to be crushed from the fine material, and conveying means mounted above the crusher plate for receiving the separated coarse material from the grading means and conveying the separated coarse material beneath the roll crusher from an upstream side to a downstream side for fragmentation, thereby causing the coarse material to be fragmented to the size of the fine material, said conveying means including means for discharging the crushed coarse material downstream of the roll crusher onto the conveyor thereby again adding the crushed coarse material to the fine material on the conveyor.

4,326,675

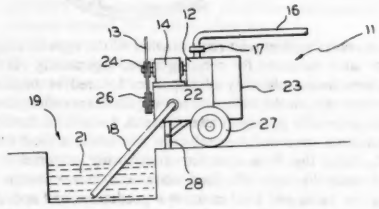
HONEY PIT FERTILIZATION SYSTEM

Carl E. Engle, Fremont, and Donald Moldenhauer, Clintonville, both of Wis., assignors to Hydro AG-Tech, Inc., St. Paul, Minn., a part interest

Continuation-in-part of Ser. No. 000,003, Jan. 2, 1979, Pat. No. 4,284,246. This application Jan. 7, 1980, Ser. No. 110,137

Int. Cl.³ B02C *18/40*

U.S. Cl. 241—236 **4 Claims**



1. In a system for pumping a mixture including solid animal wastes and resilient herbaceous material from a honey pit, said mixture to be used for fertilizer, said mixture including a liquid portion, said system for the type having a pump with an inlet and an outlet, a conduit insertable into said pit to direct said mixture towards said pump inlet, the improvement comprising:

a pulverizer assembly,

said assembly having an inlet and an outlet,

said assembly positioned outside said pit, in the path of flow of said mixture, with said conduit communicating with said assembly inlet and said assembly outlet communicating with said pump inlet,

said assembly including a pair of parallel, spaced-apart shafts,

each said shaft having a plurality of circular comminuting elements mounted coencentrically thereon,

said elements parallel to and spaced apart from each other and from said housing to enable the liquid portion of said contents to flow between said elements to said pump inlet,

said shafts being dimensioned and positioned to interdigitate said elements on one said shaft with said elements of the remaining said shaft;

bar means positioned within said housing proximate said inlet and said outlet to impact said solids as said solids are moved by said elements,

said bar means positioned parallel to said shafts and spaced apart from the outer periphery of said elements by a distance less than that of the size of solids pumpable by said pump,

said assembly inlet and said assembly outlet positioned to direct the flow of said mixture transversely to said shafts and said bar means,

said elements contacting said animal waste and herbaceous solids to strike said bar means to reduce said solids to a size selected to allow for passage thereof through said pump; and

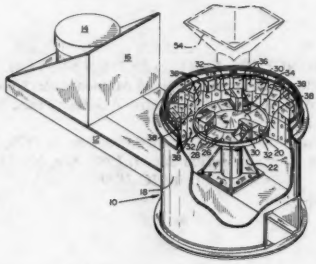
means communicating with said pump outlet to distribute said contents onto fields for fertilization purposes.

4,326,676

RECIPROCATING INFEED TUBE FOR CENTRIFUGAL IMPACT ROCK CRUSHER

Neil M. Rose, Vancouver, Wash., assignor to Canica Crushers, Ltd., Vancouver, Wash.

Filed May 12, 1980, Ser. No. 148,824
Int. Cl.³ B02C 19/00
U.S. Cl. 241—275 3 Claims



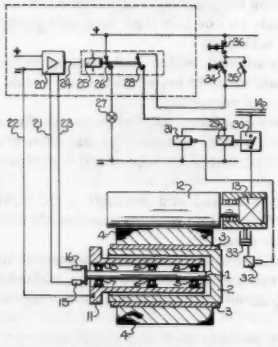
1. In a centrifugal impact rock crusher of the type having an impeller table mounted for rotating about a generally vertical axis of rotation, a plurality of impellers located at angularly spaced intervals on the table and having faces extending above the table generally perpendicular thereto, a material distributing feed cone mounted centrally on the table, a feed chute located above the feed cone for distributing material to be crushed centrally onto the feed cone, and motor means for rotating the table and feed cone at a predetermined speed so that material deposited onto the feed cone is thrown radially outwardly from the feed cone intermediate the vertical extent of the impeller faces, the improvement comprising reciprocating means associated with said feed chute for cyclically raising and lowering the mouth thereof relative to said material feed cone.

4,326,677

MONITORING CIRCUIT FOR HIGH SPEED SPINDLE ASSEMBLY

Heinz Schippers, Remscheid; Bernd Schimmels, Radevormwald, and Dieter Salm, Dhünn, all of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik, Remscheid, Fed. Rep. of Germany

Filed Aug. 29, 1980, Ser. No. 182,622
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1979, 2935218; Oct. 6, 1979, 2940612
Int. Cl.³ B65H 54/42, 63/00
U.S. Cl. 242—18 DD 8 Claims



1. In a high speed spindle assembly adapted for operation at a supracritical speed and having a spindle adapted to support a yarn package, spindle support means, bearing means rotatably mounting the spindle on the spindle support means and including relatively low modulus elastic, electrically non-conductive insert means interposed between the spindle and spindle support means, and means for rotatably driving the spindle, the improvement therewith of electric circuit monitoring means operatively connected to each of said spindle and spindle support means for detecting contact between said spindle and spindle support means in the event of undue wear or failure of said insert means interposed therebetween and for generating an electric signal upon such contact being detected.

4,326,678

TOILET TISSUE HOLDER

Earl L. Hamm, 2570 Crestdale Cir., Atlanta, Ga. 30316

Filed Mar. 19, 1980, Ser. No. 131,864
Int. Cl.³ B65H 19/00
U.S. Cl. 242—55.2 1 Claim

1. A roll paper holder comprising: a first L-shaped mounting bracket, one leg of said first bracket defining a screw opening to permit attachment to a vertical supporting surface, a second L-shaped mounting bracket horizontally spaced from said first bracket, one leg of said second bracket defining a screw opening to permit attachment to said supporting surface, a rigid arm fixedly attached to the other leg of said first bracket and extending in a horizontal direction towards, but spaced from, said second bracket, said rigid arm defining an aperture at the free end thereof, a flexible member attached to the other leg of said second bracket, a cylindrical member carried at the free end of said flexible member and co-axial therewith, and a hook portion at the opposite end of said cylindrical member for locking engagement with said aperture, said hook portion being disengaged from said aperture by movement of said cylindrical member and bending of said flexible member to place a roll of paper on said cylindrical member after which said cylindrical member is moved to lock said hook portion in said aperture, said hook and aperture being spaced from said roll of paper on said cylindrical member to permit access thereto.

4,326,679

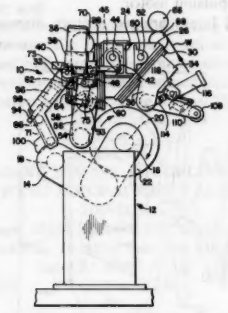
METHOD AND APPARATUS FOR ROLL CHANGING ON A WINDER DEVICE

Richard W. Phelps, and Richard S. Tetro, both of Fulton, N.Y., assignors to The Black Clawson Company, Fulton, N.Y.

Filed Jul. 2, 1980, Ser. No. 165,301
Int. Cl.³ B65H 19/20
U.S. Cl. 242—56 A 11 Claims

1. A roll changer for use on a winding machine, comprising:
an articulated cutting means movable to a web cutting position adjacent but out of engagement with one side of a web being wound on said machine and wherein it remains stationary during severing of the web;
an articulated web deflector means disposed on the opposite side of said web from said cutting means, for moving said web into engagement with said cutting means when the latter is in said web cutting position to sever said web;

means for placing a new rotating core adjacent said web when it is to be severed; and



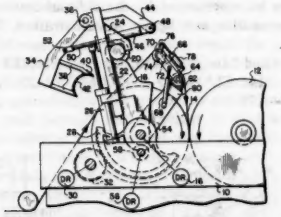
guide means adjacent said cutting means for directing the leading end of said severed web towards said new core so that it will be wound thereon.

4,326,680

WEB CUTTER FOR A SURFACE WINDER

Richard S. Tetro, and Paul E. Harmon, both of Fulton, N.Y., assignors to The Black Clawson Company, Fulton, N.Y.

Filed Jul. 2, 1980, Ser. No. 165,303
Int. Cl.³ B65H *19/20*
U.S. Cl. 242—56 A **6 Claims**



1. In a continuous winding machine of the surface winder type including a frame, a driven drum supported in said frame for engaging the surface of a roll of web material being wound, main support means on said frame for supporting said roll in driven position against said drum, and primary support means mounted on said frame for receiving and supporting a new core and moving said core into starting position in driven engagement against the surface of said drum, the improvement comprising:

an articulated cutting means mounted on said primary support means for movement therewith and movable to a web cutting position adjacent one side of but out of engagement with the web being wound on said roll and wherein it remains stationary during severing of the web;

an articulated web deflector means mounted on said frame for rotation about the axis of said drum and disposed on an opposite side of said web from said cutting means, for moving said web into engagment with said cutting means when in said web cutting position to sever said web; and

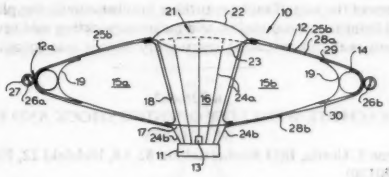
guide means adjacent said cutting means for directing said severed web towards said new core so that it will be wound thereon.

4,326,681

NON-RIGID AIRSHIP

Fredrick Eshoo, 66 Cleary Ct., Apt. 1304, San Francisco, Calif. 94109

Filed Sep. 20, 1979, Ser. No. 77,188
Int. Cl.³ B64B *1/58*
U.S. Cl. 244—30 **8 Claims**



1. A non-rigid lighter-than-air airship employing differential lift for stabilization, comprising:

a saucer-shaped envelope having a central chamber and a plurality of separate outer chambers symmetrically arranged around the central chamber;

means supported below the central chamber of the envelope for generating heated air;

a lighter-than-air medium other than heated air in the outer chambers and the central chamber having an opening in a bottom thereof dimensioned to permit heated air to enter from the means for generating heated air, the medium in the outer chambers providing a lifting force arranged symmetrically about the central chamber which is greater than that provided by the central chamber when filled with heated air;

the other chambers being separate from one another so as to prevent shifting of the lighter-than-air medium when the saucer-shaped envelope is tilted relative to level flight; and

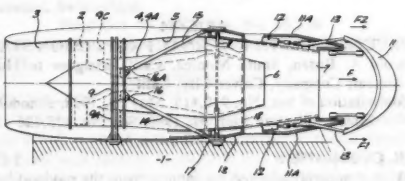
the outer chambers being designed to provide the symmetrical lifting force so as to maintain the airship in a horizontal attitude as an equilibrium state to which the airship returns when deflected.

4,326,682

MOUNTING FOR GAS TURBINE POWERPLANT

Douglas J. Nightingale, Bellview, Wash., assignor to Rolls-Royce Limited, London, England

Filed Feb. 26, 1980, Ser. No. 124,735
Claims priority, application United Kingdom, Mar. 10, 1979, 08516/79
Int. Cl.³ F02C *7/20;* **B64D** *27/20*
U.S. Cl. 244—54 **7 Claims**



7. A mounting for a gas turbine powerplant which comprises an inner annular casing containing a gas turbine engine, an outer annular casing surrounding the inner casing, a compressor connected to be driven by the engine and adapted to drive air through an annular duct defined between the casings, and a thrust reverser means at the outer casing for reversing the flow therethrough; the mounting comprising front and rear structural means arranged respectively at a front and rear location of the powerplant for supporting the powerplant laterally on a

support situated at one side of the powerplant and radially outside the outer casing, tie means at said one side of the powerplant and connected obliquely to the axis of the powerplant between the inner casing at said front location and said support at said rear location, second tie means at a side of the powerplant opposite to said one side and connected obliquely to the axis of the powerplant between the inner casing at said front location and the outer casing at said rear location such that the axes of said first and second tie means at said front location intersect the axis of said gas turbine in substantially the plane of said front structural means, and means supporting said reverser means at the outer casing rearwardly of said rear location.

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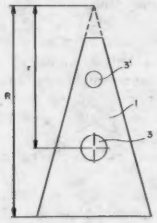
PARACHUTE WITH LOW OPENING SHOCK AND HIGH STABILITY

Jarmo I. Uotila, ISO Roobertinkatu 52 A6, Helsinki 12, Finland (00120)

Continuation-in-part of Ser. No. 898,802, Apr. 28, 1978, abandoned. This application Nov. 9, 1979, Ser. No. 92,650
Claims priority, application Finland, Apr. 22, 1977, 771282
Int. Cl.³ B64D *17/02, 17/18*
U.S. Cl. 244—145 **9 Claims**



1. A parachute which can withstand high pressure loading comprising, a non-porous canopy having an outer peripheral skirt and a substantially centrally located vent opening, said canopy including a plurality of circumferentially spaced holes each positioned at a selected radial distance from said vent opening, said plurality of holes all disposed in a zone of said canopy which is confined between 40 and 80% of the radial distance from the center of said vent opening to said skirt, the total area of said holes being from 10 to 25% of the total area of said canopy, said canopy comprising a plurality of circumferentially disposed substantially triangular gores connected to each other at seams extending radially from said vent opening to said skirt, each of said gores having a width in said vent opening which is substantially larger than $D_v \sin(180°/N)$, where D_v is the diameter of said vent opening and N is the number of gores comprising said canopy, each seam between adjacent gores being substantially a straight line.

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SPACECRAFT WITH INTERNAL PROPULSION STAGES

Harold A. Rosen, Santa Monica, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 910,415, May 30, 1978, abandoned. This application Mar. 31, 1980, Ser. No. 135,426
Int. Cl.³ B64G *1/14, 1/40*
U.S. Cl. 244—158 R **1 Claim**

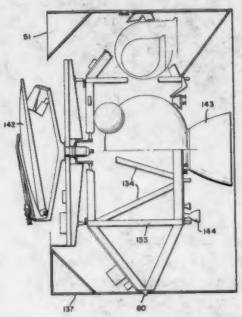
1. A spacecraft adapted for launch from the payload bay of the space shuttle comprising:

a generally cylindrical spacecraft having a diameter only slightly less than the diameter of said payload bay, and having a length as short as possible, said spacecraft having a ratio of roll-to-pitch inertia greater than one;

a solid perigee propulsion motor supported in the center of said spacecraft and completely contained therein with its thrust axis along the central axis of said spacecraft and with its center of gravity located substantially coincident with the center of gravity of said spacecraft to minimize the pitch moment of inertia;

a plurality of liquid propellant tanks disposed within said spacecraft and arranged symmetrically around said solid perigee propulsion motor;

a plurality of liquid apogee motors disposed within said



spacecraft and connected to said propellant tanks, said liquid apogee motors being arranged symmetrically around said solid perigee propulsion motor, and being adapted for simultaneous operation to minimize coning of said spacecraft during thrusting; and

means for separating and jettisoning said solid perigee propulsion motor after said perigee motor has been used.

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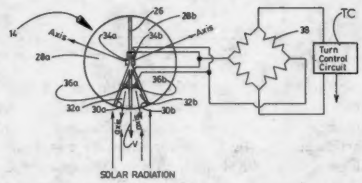
SUN-SENSING GUIDANCE SYSTEM FOR HIGH-ALTITUDE AIRCRAFT

Robert D. Reed, Lancaster, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 12, 1980, Ser. No. 129,783
Int. Cl.³ G05D *1/00;* **B64C** *13/20*
U.S. Cl. 244—175 **4 Claims**



1. In a sun-sensing guidance system for high-altitude, unmanned aircraft, the improvement comprising:

A. a disk-shaped body adapted to be mounted aboard an aircraft in exposed relation to solar radiation and having defined therein a plurality of mutually isolated chambers, each chamber of said plurality being characterized by an opening and having a photosensor disposed therein and arranged in facing relation with respect to the opening for receiving indicent solar radiation, each photosensor being adapted to provide a photovoltage output in response to incident solar radiation;

B. circuit means interconnecting the plurality of photosensors in paired relationship including a wheatstone bridge circuit connected between the photosensors of each pair for providing a voltage output indicative of heading error

in response to detected imbalance in the photovoltage output derived from a pair of photosensors;

C. mounting means supporting said disk for rotation to a null position wherein the photovoltage output for the photosensors is balanced at said bridge circuit when the aircraft is on course; and

D. means for rotating said disk for selecting a course including drive means for imparting rotation to the disk, a ground-based radio signal transmitter circuit and a radio signal receiver circuit mounted on said aircraft and electrically connected with said drive means.

4,326,686

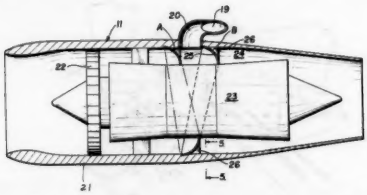
FAN JET ENGINE BYPASS AIR DELIVERY SYSTEM FOR BLOWN WING AIRCRAFT LIFT AUGMENTATION DEVICE

Thomas M. Runge, 2501 Galewood Pl., Austin, Tex. 78703

Filed Feb. 15, 1980, Ser. No. 118,999

Int. Cl.³ B64C *21/04*

U.S. Cl. 244—207 **3 Claims**



1. In a fixed wing aircraft, at least one fan jet engine having a housing and a fan bypass air passage within the housing in surrounding relationship to an engine compressor and turbine, a bypass air bleed-off conduit coupled in said housing and communicating with said passage and adapted to conduct fan bypass air to a wing lift augmentation system of the aircraft, and a fan bypass air shunting device on the engine housing and being movable to an active position within said passage near said bleed-off conduit and to an inactive position substantially outside of said passage, and an actuator means for said shunting device, said shunting device comprising a normally flat metallic strip coupled to said actuator means to be moved thereby, and coacting spaced relatively stationary guide devices for said strip within said passage and attached to said housing, said guide devices adapted to shape said strip into a helix of approximately one convolution within said passage and to impart to the strip an arcuate configuration at all points on the circumference of the strip, whereby the strip will act as an air scoop in said passage to shunt fan bypass air into said bleed-off conduit.

4,326,687

PLURAL LEG STAND

C. Wayne Clyburn, Cincinnati, Ohio, assignor to James David Mfg. Corp., Creve Coeur, Mo.

Filed Jul. 30, 1980, Ser. No. 173,464

Int. Cl.³ F16M *11/38*

U.S. Cl. 248—168 **8 Claims**

1. A stand comprising

at least three legs, said legs being movable between a collapsed storage position at which said legs are disposed generally parallel one to another and an erect use position at which said legs are located in a generally polyhedron shaped configuration, and

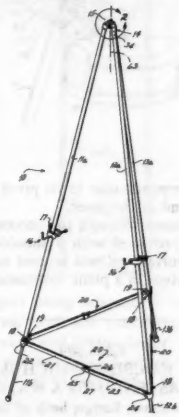
a one-piece connector head formed from an elastomer for connecting said legs together one to the other at the top end thereof, said connector head comprising

a center section of a generally regular geometry, said center section having a number of sides equal to the number of said legs,

an ear section extending outwardly from each side of said center section, each ear section being formed integral with said center section, and said center section and said ear sections defining a generally planar configuration when said legs are in said storage position,

a cup depending from each of said ear sections, said cup being formed integral with said ear, and said cup being adapted to receive one of said legs in assembly therewith,

hinge line structure defining a number of grooves on a face of said connector head between said center section and said ear sections, said grooves being equal in number to the number of said legs, said grooves defining a regular geometry that generally coincides with the



regular geometry of said center section, and said structure cooperating with said ear sections and said center section to permit said legs to move between storage and use position, and

a pad formed integral with said center section, said pad extending upwardly above said center section, said pad having a geometry identical to and overlying the regular geometry defined by said center section, said pad's sides thereby cooperating with said grooves to aid in defining said hinge line structure, and said pad having a top face that is positioned above a phantom plane that incorporates the uppermost points on said ear sections when said stand is in said use position.

4,326,688

PLATFORM FOR PHOTOGRAPHIC OR CINEMATOGRAPHIC STAND

Patrick Posso, Lausanne, Switzerland, assignor to Gefitec S.A., Lausanne, Switzerland

Filed Oct. 15, 1979, Ser. No. 85,124

Claims priority, application Switzerland, Oct. 20, 1978, 10867/78

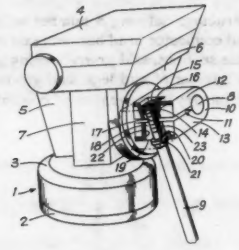
Int. Cl.³ F16M *11/04*

U.S. Cl. 248—178 **4 Claims**

1. In an improved platform for a photographic or cinematographic stand, comprising a turret mounted to rotate about a vertical axis with respect to foldable legs and supporting, for the fixation of a shot taking apparatus, a plate fast with a shaft mounted to rotate about a horizontal axis with respect to this turret, the shaft being provided with an outwardly inclined control hand lever for facilitating the bidirectional swivelling of the plate, foldable against the folded legs and connected to said shaft by means of a swivelling device with built-in locking system for at least two positions of this lever, which device comprises a split sleeve freely fitted over said control shaft and elastically deformable by bringing its two arms closer to each

other or separating them by means of the threaded end of the lever, wherein

the first arm of the split sleeve defines a cylindrical bearing surface of which the geometrical axis is substantially at right angles to that of the shaft and in which is disposed a nut shaped at least partially as a roller which presents a



tapped hole perpendicular to its pivot axis for screwing the threaded end of the lever,

and said lever passes through the second arm of the split sleeve and is provided with a shoulder abutting on an outer shaped surface of said second arm, the lever thus being able to pivot in a plane substantially parallel to the shaft.

4,326,689

MOUNT FOR A HOUSING WHICH IS RELEASABLY FASTENED TO A WALL

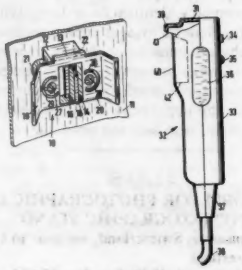
Harry Edel, and Wolfgang Lange, both of Berlin, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 23, 1980, Ser. No. 114,672

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1979, 2907322

Int. Cl.³ A47B *91/00*

U.S. Cl. 248—359 **5 Claims**



1. In a mount assembly for releasably fastening a housing to a wall, including a unitary wall mount member arranged to be fixed to the wall and a housing mount member fastened to a wall of the housing, the improvement wherein: said wall mount member comprises a base fixable to the wall and presenting a tongue, said base including a top and a front wall, said base presenting a first elongate detent element so arranged that when said base is fixed to the wall, said tongue is located along the top of said base and presents a horizontally oriented surface and said detent element presents horizontally spaced, vertically oriented surfaces and projects away from said front wall; and said housing mount member comprises means defining a slot in the housing wall and a second elongate detent element so arranged and constructed that when said housing mount member is fastened to said wall mount member said slot engages said horizontally oriented surface of said tongue and said second detent element engages said vertically oriented surfaces of said first detent element and comes into positive locking engagement with said first detent element.

4,326,690

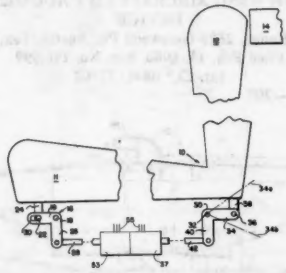
SEAT ADJUSTING MECHANISM

Joseph Pickles, Birmingham, and Chester S. Fudala, Troy, both of Mich., assignors to Ferro Manufacturing Corporation, Southfield, Mich.

Filed May 3, 1979, Ser. No. 35,495

Int. Cl.³ B60N *1/02*

U.S. Cl. 248—396 **7 Claims**



1. A vehicle seat having means for supporting its front and rear edges for independent vertical movement, said means comprising independent front and rear edge lift mechanisms comprising front and rear lift devices for selectively raising and lowering said front and rear seat edges, control means comprising a first movable control member operable to actuate said front edge lift mechanism only in a direction to lower said front edge, a second movable control member operable to actuate said rear edge lift mechanism only in direction to raise said rear edge, and a third control member movable from an intermediate position in one direction to actuate both of said lift mechanisms simultaneously to raise both the front and rear edges of said seat and movable in the opposite direction to actuate both of said lift mechanisms simultaneously to lower both the front and rear edges of said seat in which said lift mechanisms comprise motor means connected to said lift devices and adapted to stall when the corresponding seat edge reaches a limiting raised or lowered position;

displacement of said third control member in either direction from its intermediate position while said seat is in an untilted intermediate position being effective to energize both of said motor means to activate both of said lift devices in the same direction to move said seat vertically without tilting until said seat reaches its limiting untilted raised or lowered position;

displacement of said third control member in either direction from its intermediate position while said seat is in a forwardly tilted intermediate position being effective first to energize both of said motor means to activate both of said lift devices in the same direction to move said seat vertically without changing the angle of tilt until one of said seat edges reaches its upper or lower limiting position and stalls the motor means connected to its lift device, at which time movement of said control member back to its intermediate position deenergizes both of said motor means to leave said seat in forwardly tilted, raised or lowered limiting position;

retention of said third control member in its last mentioned displaced position after stalling of said last mentioned motor means being effective to continue energization of both motor means, the motor means actuating the lift device connected to the seat edge which has reached its

limiting position remaining stalled while the other motor means continues to actuate the other lift device until both seat edges are in the same raised or lowered position and said seat assumes a limiting raised or lowered untilted position;

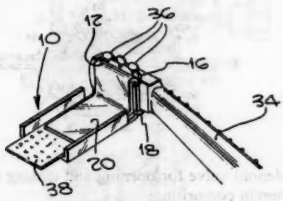
and operation of the appropriate one of said first or second control members while said seat is in a limiting raised or lowered untilted position, or in any position of less than maximum forward tilt being effective to energize the corresponding lift device to lower the front edge or raise the rear edge of the seat, to tilt the seat forwardly.

4,326,691

MUSIC HOLDER

Bert A. Lloyd, 1756 Tamarind Ave., Los Angeles, Calif. 90028

Filed Nov. 9, 1979, Ser. No. 92,699
Int. Cl.³ G10G 5/00
U.S. Cl. 248—443 **2 Claims**



1. A generally transparent generally L-shaped music holder for stringed instruments which have machine heads comprising:

a generally flat foot member extending in a first direction and being adapted to being releasably mounted to a stringed musical instrument in a location which is generally concealed from an audience while the instrument is being played;

elastic means for releasably mounting said foot member against the machine heads of a stringed instrument;

a leg member extending in a second direction approximately normal to said first direction, said leg member including a back plate and a face plate spaced apart in generally parallel relationship to receive a generally flat sheet of music therebetween, said back plate extending further in said second direction than said face plate and having a notch therein extending toward said foot member, whereby grasping a sheet of music received between said plate is facilitated, said face plate having an arcuate outer transverse edge remote from said foot member permitting easy insertion of said sheet of music between said plates, said leg member including flanges positioned to generally block the removal of said sheet of music in a transverse direction.

4,326,692

MIRROR BRACKET

Weston R. Loomer, Walton, Ky., assignor to Litton Systems, Inc., Florence, Ky.

Division of Ser. No. 890,219, Mar. 27, 1978, Pat. No. 4,218,616.
This application Sep. 7, 1979, Ser. No. 73,194
Int. Cl.³ A47F 7/14
U.S. Cl. 248—488 **4 Claims**

1. A reflector retaining bracket comprising:

a longitudinally extending rear wall;

first and second side walls, said side walls being spaced from one another and extending perpendicular from a surface of said rear wall; and

first and second pluralities of fingers, each of said first and second pluralities of fingers extending perpendicularly from a corresponding one of said first and second side walls and toward one another,

said rear and side walls and said pluralities of fingers forming a channel adapted to maintain a plurality of reflectors therein,

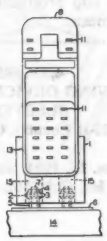
each of said fingers being adapted to be folded inwardly toward said rear wall for preventing the longitudinal movement, toward said folded finger, of a reflector positioned in that portion of said channel aligned with the fingers next adjacent to said folded finger.

4,326,693

SHELF MOUNT FOR VITAL PLUG-IN RELAY

Peter M. Noble, Valencia, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Dec. 17, 1979, Ser. No. 103,899
Int. Cl.³ F16M 5/00
U.S. Cl. 248—635 **4 Claims**



1. Apparatus for mounting a plug-in type relay on a shelf, comprising,

(a) a molded elastomeric holder formed to hold a plug-in relay in the required operating position,

(b) a plurality of mounting diaphragms molded into said holder at preselected locations,

(c) mounting means for said holder positioned on said shelf at matching locations for inserting through said diaphragms,

(d) a disk positioned above and below each diaphragm,

(e) a spacer positioned on said mounting means below each lower disk and having a length selected to space said holder a preselected distance above said shelf, and

(f) locking means securable to said mounting means for locking said holder and diaphragms against each associated pair of disks and spacer whereby vibration of a relay

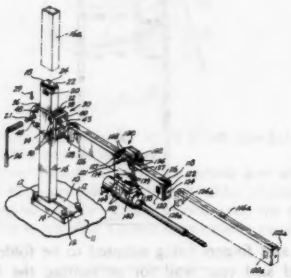
mounted in said holder due to shelf movements is substantially dampened by said diaphragms and disks.

4,326,694

TOOL STAND

Allen Destree, 5218 92nd SW., Seattle, Wash. 98204

Division of Ser. No. 952,916, Oct. 19, 1978, Pat. No. 4,234,155.
This application May 5, 1980, Ser. No. 133,613
The portion of the term of this patent subsequent to Nov. 18, 1997, has been disclaimed.
Int. Cl.³ F16M *1/00*
U.S. Cl. 248—676 **9 Claims**



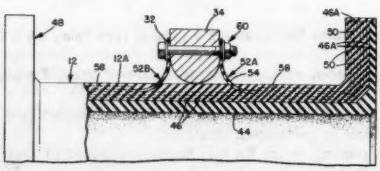
1. Column construction for tool stands, comprising:
a plurality of rectangular conduit segments, each of said segments having a protruding block means in one end thereof axially disposed within said conduit segment and a recessed block means at the other end thereof axially disposed within said conduit segment, said protruding block means receivable within an end adjacent conduit segment, said protruding block means and said recessed block means being spaced apart and having axial passageways therein to receive a fastener said conduit segments including access apertures for insertion of a fastener means within the said axial passageways whereby perimeter contact of said conduit segments results without face-to-face contact of said protruding block means upon said recessed block means.

4,326,695

POSITIVE OPENING DEVICE FOR PINCH VALVE SLEEVES

Edgar B. Lincoln, 626-B Country Club Pkwy., Mount Laurel, N.J. 08054

Filed Jan. 15, 1981, Ser. No. 225,413
Int. Cl.³ F16L *55/14*
U.S. Cl. 251—7 **7 Claims**



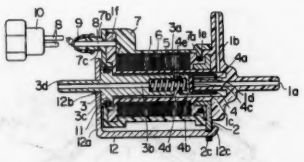
1. A positive opening device for a pinch valve sleeve, said sleeve including an elastomer inner layer, multiple plies of fabric reinforcement extending through said sleeve, end flanged portions on said sleeve, at least some of said fabric reinforcement plies extending through said sleeve and extending up into said end flanges and being added externally of said initial reinforcement plies, sleeve opening flaps constituting integral parts of said at least some fabric reinforcement plies and formed as extensions of the fabric thereof, additional plies of reinforcement fabric overlying said flap forming portions and securing said flaps in the fabric structure of the sleeve, said flaps including two individual flaps positioned proximate to and extending toward the center of said sleeve, and being integral parts of the fabric reinforcement structure of the sleeve.

4,326,696

SOLENOID VALVE

Eizi Ishikawa, Nagoya; Ryouichi Matsuura, Anjo, and Kiyotosi Yano, Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 8, 1979, Ser. No. 46,756
Claims priority, application Japan, Jun. 14, 1978, 53-81274[U]
Int. Cl.³ F16K *31/06*; H01F *7/08*
U.S. Cl. 251—129 **14 Claims**



1. A solenoid valve for opening and closing a fluid passage formed therein comprising:
a nonmagnetic bobbin having a body with a center hole and having fluid passage means,
a coil wound around said bobbin,
a stator core located in said center hole of said bobbin,
a movable core movably positioned in said center hole of said bobbin for opening and closing said fluid passage means,
spring means positioned between said stator core and said movable core for urging said movable core in a direction to separate said movable core from said stator core,
magnetic path means having the greater part thereof insert-molded in the body of said bobbin and surrounding the outer surface of said movable core such that the inner surface of said magnetic path means and the outer surface of said movable core are in an opposed relationship with each other,
said magnetic path means comprising a ring shaped portion and a flanged portion, said flanged portion being projected outwardly from the outer surface of said ring-shaped portion and having a part thereof further projected to the outside of said bobbin body,
a cover formed to cover the periphery of said coil and fixed to said bobbin, and
a yoke magnetically coupling said stator core and said magnetic path means.

4,326,697

VALVES WITH NON-LUBRICATED PLUG

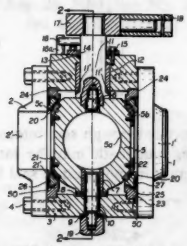
Roger Autage, 22 rue Jeanne d'Arc, Résidence Domrémy, Sévres, and Georges Dupont, 13 rue Questroy, Epinay S/Seine, both of France

Continuation of Ser. No. 812,136, Jul. 1, 1977, abandoned, which is a continuation of Ser. No. 417,709, Nov. 21, 1973, abandoned, which is a continuation of Ser. No. 875,827, Nov. 12, 1969, abandoned. This application Mar. 20, 1980, Ser. No. 132,096
Claims priority, application France, Nov. 15, 1968, 174018
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—174 **2 Claims**

1. A valve comprising a valve body having an inlet and an outlet; a plug having a fluid passage therein; means for rotatably mounting said plug in said valve for movement between

an open position in which said passage communicates with both said inlet and said outlet and a closed position in which said passage is out of such communication, said plug having a pair of opposed spherical surface portions defined by a sphere having a center located at the intersection of the axis of rotation of said plug and the axis of said passage; and

means for sealing said valve in said closed condition comprising a pair of annular sealing gaskets secured respectively to said spherical surface portions of said plug; a pair of sealing seats mounted on said valve body in surrounding relation with said inlet and outlet, each of said sealing seats including a fixed annular member secured to said valve body, an annular bearing member mounted for axial movement relative to said fixed annular member, means for biasing said annular bearing member toward said plug, the portion of each bearing member engageable by said annular gasket having a spherical surface portion, additional rotary movement of said plug toward said closed position being effective for moving said annular bearing member adjacent said biasing means, each movable bear-



ing member having said spherical surface portion flanked by a marginal recessed toric surface symmetrically disposed with respect to the axis of rotation of said plug on said spherical surface portions so as to form a marginal groove adjacent said bearing member spherical surface portion, said gaskets having compressible portions protruding beyond said plug surface for progressive free engagement within said marginal groove and subsequent compressive engagement with said spherical surface portions to complete said valve seal when said plug is moved into said closed position, the portions of said sealing seats engageable by said gaskets being in the form of portions of a sphere having the same center as said spherical surface portions of said plug, said protruding portion being progressively deformable against said spherical surface portions as said protruding portion moves into engagement therewith from said marginal toric surface upon said plug being moved into said closed position, said protruding portion being in a non-deformed released configuration unless said plug is adjacent said closed position.

4,326,698

GATE VALVE

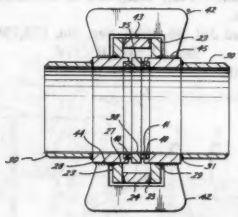
Daniel G. Constantino, Mexico City, Mexico, assignor to Fip, S.A. de C.V., Mexico City, Mexico

Filed Aug. 20, 1979, Ser. No. 67,817

Int. Cl.³ F16K *27/04, 27/10*

U.S. Cl. 251—327 **6 Claims**

1. A gate valve, comprising a fabricated, boxlike body having front and side walls and openings formed in the front walls, and hubs extending within the openings and welded to the front walls to provide a flowway through the body, the inner ends of the hubs having annular pockets in which seats are received to provide a continuation of the flowway, a gate longitudinally movable within the body between positions opening and closing the flowway through the seats, laterally disposed, generally "C"-shaped, rigid reinforcing flanges having inner side edges which are spaced from but extend closely about the opposite side walls and adjacent ends of the front walls of the body, one end edge of each flange being welded to one hub and the other end edge thereof being welded to the other hub, whereby each said flange functions as an eccentri-



cally loaded tension member, and a conduit connected to and extending outwardly from the outer end of each hub to enable the valve to be connected in a line, each conduit being thinner than the hub to which it is connected.

4,326,699

OIL-TEMPERING APPARATUS FOR PIPES

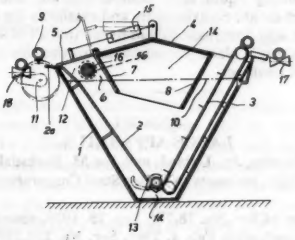
Wilfried Carneim, Langenfeld; Herbert Hillemanns, Ratingen; Hermann Völlmecke, Mülheim; Hans Ribken, Erkrath; Heinz Schumacher, Ratingen, and Kurt Roether, Düsseldorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 22, 1980, Ser. No. 180,419

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1979, 2935242

Int. Cl.³ C21D *1/00*

U.S. Cl. 266—114 **4 Claims**



1. Apparatus for treating pipes in oil, comprising:

a pan for receiving oil, the pan having a bottom;

means for feeding pipes towards said pan so that the pipes can drop into the pan;

handling means for at least one pipe in the bottom of the pan;

means for taking pipes out of said pan;

a cover on top of said pan having at least a portion constructed as a closable and openable flap, there being means for opening and closing said flap;

said flap having its position in relation to said means for feeding, so that pipes can be fed into the pan when the flap is opened;

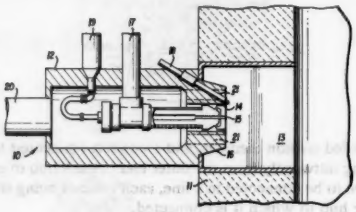
partition means extending from the cover in down direction for defining a limited and partially enclosed space above a surface level of an oil bath in the pan, under the flap; and

means for sucking vapors from said space under the flap.

4,326,700
DUAL FUEL BURNER FOR METAL MELTING FURNACES

David F. Arp, Carroll County, Ga., and Ronald L. Pariani, Escambia County, Fla., assignors to Southware Company, Carrollton, Ga.

Filed Jul. 30, 1980, Ser. No. 173,790
Int. Cl.³ F27B 1/14
U.S. Cl. 266—219 7 Claims



1. An improved dual fuel burner assembly for firing a vertical shaft metal melting furnace with a fuel selected from the group consisting of gaseous and liquid fuel and combinations thereof, of the type having a combustion chamber adapted to be mounted within the wall of said furnace; a burner housing sealingly mounted to said chamber and serving as means for introducing combustion air thereto; means for continuously introducing fuel to said chamber; and a means within said chamber for igniting the fuel and air,

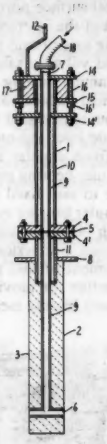
wherein the improvement comprises two of said means for continuously introducing fuel which further comprises: a first means which is a liquid fuel supply pipe terminating in and communicating with a liquid fuel spraying nozzle, which is contained within and surrounded by a second means; said second means is a premixed gas-and-air supply pipe terminating in and communicating with a premixed gas-and-air nozzle, which is contained within and surrounded by the burner housing which serves as a combustion air supply means, which means communicates with a combustion air nozzle; and wherein each of said means for introducing liquid fuel, combustion air, and premixed gas-and-air are co-axial with, and extend to the same point within, said combustion chamber so that all of said nozzles lie in a single plane perpendicular to the axis of the combustion chamber.

4,326,701
LANCE APPARATUS

Ralph P. Hayden, Jr., Upland, and Joe M. Barksdale, Ontario, both of Calif., assignors to Kaiser Steel Corporation, Oakland, Calif.

Continuation of Ser. No. 78,771, Sep. 29, 1979, abandoned. This application Feb. 4, 1981, Ser. No. 231,297
Int. Cl.³ C21C 7/02
U.S. Cl. 266—225 8 Claims

1. Apparatus for use in the treatment of molten baths comprising, a vessel in the nature of a ladle containing molten metal to be treated, a lance suspended from above the surface of the molten metal and not forming part of the walls of said vessel, said lance comprising a separate upper section and a separate lower section adapted to be immersed in said molten metal, each of said sections having internal pipes extending along substantially the length thereof, fastening means for connecting said upper and lower sections at their respective abutting ends so that said pipes form a continuous internal passage along substantially the length of the lance, said lower section having a protective refractory sheath surrounding said internal pipe along the entire length of said section forming the outer wall thereof and a horizontally disposed flat plate positioned above said refractory sheath and extending radially outward to thereby serve as a splash guard for said upper section of said lance located above said guard, clamp means at the top of said upper section, means for engaging said clamp means for moving said lance into and away from said molten bath, and means

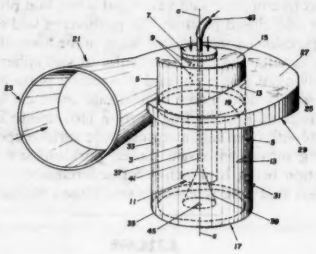


for introducing materials through said internal pipe whereby materials for treating said bath may be introduced therein when said lower section is immersed in said bath.

4,326,702
SPRINKLER BURNER FOR INTRODUCING PARTICULATE MATERIAL AND A GAS INTO A REACTOR

Paul E. Oueneau, Cornish, N.H. 03746; Horst J. Richter, P.O. Box 59, Norwich, Vt. 05055, and Reinhardt Schuhmann, Jr., 1206 Hayes St., West LaFayette, Ind. 47906

Filed Oct. 22, 1979, Ser. No. 86,659
Int. Cl.³ F23D 1/02
U.S. Cl. 266—267 31 Claims



1. An apparatus for introducing solid particulate material and a gas downward into a separate reactor as a paraboloidal suspension, so as to effect excellent gas-solid contact and rapid reaction in the separate reactor between the particulate material and the gas by mixing and the particulates are uniformly and widely distributed in the separate reactor, comprising:

(a) an inner tubular member having an upper solids inlet end and a lower outlet;

(b) means for feeding solid particulate material by gravity through the inlet end of the inner tubular member and axially therethrough for exiting from said outlet;

(c) an outer cylindroidal member having a circular wall, a closed upper end, and a lower exhaust end, and a gas inlet in said circular wall intermediate said ends, the outer

cylindroidal member positioned concentrically about the inner tubular member such that the outlet of the inner tubular member is positioned intermediate the gas inlet and exhaust end of the outer cylindroidal member; and

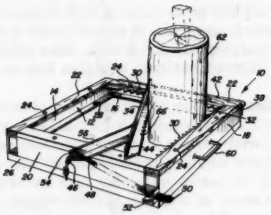
(d) means for introducing the gas tangentially through the gas inlet in said circular wall comprising a conduit arranged to tangentially charge said gas into said cylindroidal member substantially about said circular wall, whereby said gas is directed about the inner periphery of said circular wall and towards said exhaust end such that the solid particulate material exiting the outlet of the inner tubular member is suspended therein, and the gas is discharged from the exhaust end of the cylindroidal member at a tangential spreading velocity greater than one-half the vertical downward velocity thereof.

4,326,703

CUT LOG SECTION HOLDER FOR LOG SPLITTING OPERATION

William R. Marley, 147 Filmore St., Pocatello, Id. 83201

Filed Aug. 26, 1980, Ser. No. 182,396
Int. Cl.³ B25B *1/00*
U.S. Cl. 269—156 **8 Claims**



1. A cut log section holder for holding cut log sections during splitting operations, said holder defining a base for suitable support from a supportive surface, said base defining a pair of generally horizontal, relatively angulated, elongated and convergent first and second gripping jaws defining a horizontally opening crotch adjacent their convergent ends for frictionally gripping adjacent peripherally spaced surfaces of an upstanding log section, said first jaw including longitudinally spaced notches formed therein opening outwardly of the side thereof remote from the second jaw, an elongated third jaw having pivot pin means on one end thereof removably and pivotably receivable in a selected notch of said notches for swinging movement of the other end of said third jaw toward and away from the end portion of said second jaw remote from said first jaw, said other end of said third jaw and the end portion of said second jaw remote from said first jaw including means defining corresponding anchor points, an elongated tension member, first anchor means anchoring one end portion of said tension member to one of said anchor points, the other end portion of said tension member and the other anchor point including means for readily releasably anchoring selected longitudinally spaced portions of the second end portion of said tension member to said other anchor point, said first anchor means incorporating yieldable means for adjusting tension lengthwise of said tension member.

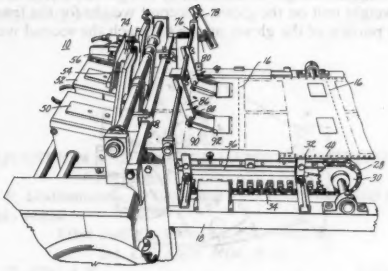
4,326,704

TIPPING MACHINE

William H. Barr, Hingham, Mass., assignor to Universal Tipping Company Incorporated, Hanover, Mass.

Filed Jun. 13, 1979, Ser. No. 48,149
Int. Cl.³ B65H *39/02*
U.S. Cl. 270—58 **7 Claims**

1. A tipping machine for placing articles onto a series of predetermined positions on a moving support comprising a feeder mechanism for placing articles on said support slightly behind the predetermined positions, and position adjustment means for thereafter contacting each article and pushing it forwardly on the moving support to the predetermined posi-



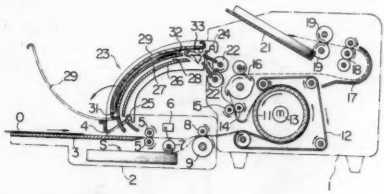
tion, in which said feeder mechanism accelerates each article to the approximate speed of the moving support before placing said article on the support.

4,326,705

ORIGINAL SHEET CIRCULATION APPARATUS OF COPYING MACHINE

Yasuhiro Takahashi, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 20, 1980, Ser. No. 123,009
Claims priority, application Japan, Feb. 27, 1979, 54-22108
Int. Cl.³ B65H *3/44, 29/60*
U.S. Cl. 271—9 **4 Claims**



1. In an apparatus for selectively recirculating an original through a copying machine having an inlet for receiving the original to be copied, means for receiving said original and aligning it in superimposed relation with a copy sheet, means for transporting said superimposed original and copy sheet in unison past an exposure station, and means for separating said original from said copy sheet and directing said copy sheet to a receiving station and said original to an outlet, the original recirculating apparatus including means for removably attaching it as a unit to said copying machine, a chamber positionable adjacent said outlet for receiving originals exiting from said copying machine and selection means positioned adjacent said chamber for alternatively retaining an original in said chamber or directing it back to the inlet of the copy machine until the desired number of copies of the original are produced.

4,326,706

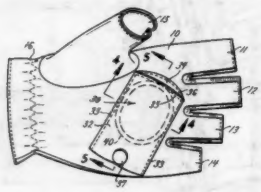
JOGGING GLOVE

Phillip K. Guthrie, Menard, and Richard W. Pillow, Decatur, both of Ill., assignors to Fitness Concepts, Inc., Decatur, Ill.

Filed Jul. 9, 1979, Ser. No. 55,530
Int. Cl.³ A63B *21/12*
U.S. Cl. 272—119 **3 Claims**

1. A pair of athletic gloves for jogging, one glove being shaped and constructed for wearing on the left hand and the

other glove being shaped and constructed for wearing on the right hand, each glove having a main glove portion. a portion engageable around the palm portion of the hand, and finger portions to hold the glove out from the wrist; and a first weight unit therefor having a somewhat flattened weight, and means attaching the weight to the back of the glove portion to hold the weight unit on the glove, a second weight for the front or palm portion of the glove, means to attach the second weight



transversely to the palm portion of the glove adjacent the outer metacarpal knuckle joints, extending at a slight angle to the metacarpal area of the second and third fingers, the second weight being disposed to extend essentially along the said knuckle area of the plam portion of the glove inwardly of the finger portions, and essentially outwardly displaced away from the thumb area, to permit flexing of the fingers when the weight is in place into the positions they normally assume in jogging.

4,326,707

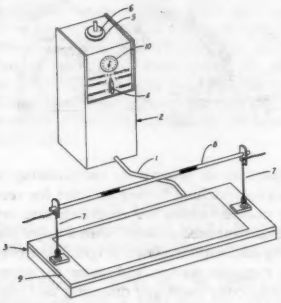
HYDRAULIC EXERCISER

Dennis C. Strecker, 1079 Colonial Club Dr., Harahan, La. 70123

Continuation-in-part of Ser. No. 946,440, Sep. 27, 1978, abandoned. This application Sep. 4, 1979, Ser. No. 72,037

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—130 **9 Claims**



1. An exerciser for a human user to perform physical exercising, comprising:

human exercising force connection means for the human user to physically undergo exercising force in the performing of physical exercising for development of the human muscles,

a flexible, continuous, load bearing line attached to two spaced locations on said exercising force connection means and extending away from said exercising force connection means;

a hydraulic fluid cylinder with an incompressible hydraulic liquid fluid therein associated with said exercising force connection means having a moveable piston extending out of and moveable longitudinally in said cylinder in contact with said hydraulic fluid;

a first pair of sheaves located in association with a first end of said cylinder, and a second pair of sheaves located in association with the other, opposite end of said cylinder, at least one of said second pair of sheaves being mounted on and carried by said piston, said flexible, load bearing line extending from a first location on said exercising force connection means toward said cylinder and down around one sheave of said first pair, then over to and around one of the sheaves of said second pair, then back over and around the other of the sheaves of said first pair, then back over and around the other of the sheaves of said second pair, and then extending back to the other of said two locations on said exercising force connections means, force applied to said exercising force connection means in a direction away from said cylinder causing said piston to move into said cylinder.

4,326,708

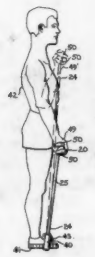
METHOD FOR USING ELASTIC CABLE EXERCIZER BAR

Robert S. Hinds, 1803 Regent St., Madison, Wis. 53705

Division of Ser. No. 755,552, Dec. 30, 1976, Pat. No. 4,195,835. This application Jul. 27, 1979, Ser. No. 61,181

Int. Cl.³ A63B *21/02*

U.S. Cl. 272—138 **1 Claim**



1. The method of tensioning a bight of elastomeric cable which depends in recessed disposition from between bifurcated projections configured as end extremities of a bar elevated above fixedly held ends of said tensioned cable comprising the step of rotating said bar until said cable is wrapped around at least one of said bifurcated end extremities and whereupon with continued rotation said cable is at least partially wound around said bar.

4,326,709

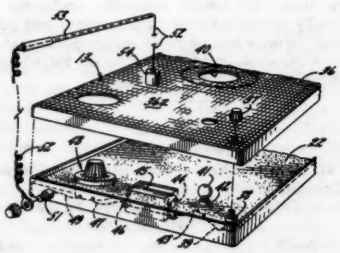
FISHING FOR CARDS GAME

Ronald A. Croyle, R.D. #1 Helm Rd., Adrian, Pa. 16210

Filed Dec. 10, 1979, Ser. No. 101,777

Int. Cl.³ A63F *9/00*

U.S. Cl. 273—1 GC **6 Claims**



1. A fishing for cards game of skill including in combination a game board housing having a planer field of play upper

surface member and a lower planer support surface member parallel to said upper surface,

said field of play of said upper planer surface being formed of an electrically conductible material,

first side members integrally secured to said upper surface member and disposed in a direction toward said lower surface,

second side members integrally secured to said lower support surface and disposed in a direction toward said upper surface,

said upper surface with said first side members and said lower surface with said second side members cooperating to form a flat box shaped compartment,

spacer means having a roughened textured surface disposed between said upper surface and said lower surface and in contact with said lower surface,

said planer field of play upper surface having an opening centrally disposed in said field of play, said opening communicating with an open region between said upper surface member and said roughened textured surface of said spacer means,

playing cards disposed within said open region and on said roughened textured surface, each of said playing cards having a magnetizable element secured thereto,

permanent magnet fishing means cooperatively positioned on said planer field of play whereby movement of said permanent magnet fishing means along said planer field of play results in the attraction of said magnetizable elements of said playing cards whereupon said playing cards may be drawn to said centrally disposed opening and withdrawn,

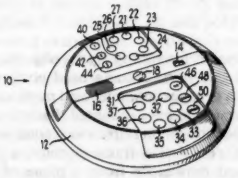
a source of power is connected to said permanent magnet fishing means and to said electrically conductive material, as well as an indication means to thereby form a complete playing surface contact detection circuit which provides an indication via said indication means so long as said permanent magnet fishing means is in contact with said electrically conductive material of said field of play.

4,326,710

TALKING ELECTRONIC GAME

Jeffrey D. Breslow, Highland Park, and Erick E. Erickson, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 8, 1980, Ser. No. 119,618
Int. Cl.³ A63F 9/00; G09B 7/02
U.S. Cl. 273—1 E **29 Claims**



1. An electronic talking game apparatus, comprising:

means for generating a plurality of audibly perceptible beginning phrases and a plurality of audibly perceptible ending phrases, each of said ending phrases being associated with a single one of said beginning phrases;

a plurality of manually operable means, each of said manually operable means being associated with a single one of said ending phrases, said generating means being operative to generate the one of said ending phrases associated with each of said manually operable means upon the actuation thereof;

means for rendering said generating means operative to generate one of said beginning phrases; and

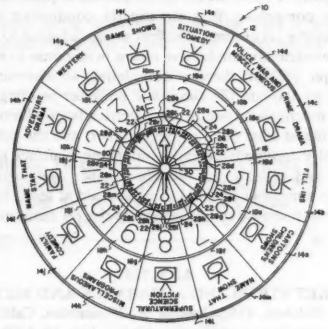
means responsive to the generation of one of said beginning phrases and the subsequent actuation of one of said manually operable means for providing a first indication if the actuated manually operable means is associated with the ending phrase that is associated with the generated beginning phrase and for providing a second indication if the actuated manually operable means is associated with an ending phrase that is not associated with the generated beginning phrase.

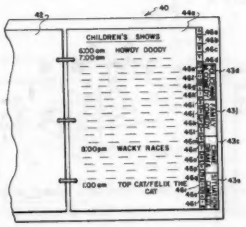
4,326,711

QUESTION AND ANSWER GAME EMPLOYING CHANCE-TAKING MEANS

Gary P. Giallombardo, 1378 Golden Gate Blvd., Mayfield Hts., Ohio 44124

Filed Jun. 13, 1980, Ser. No. 159,376
Int. Cl.³ A63F 5/04, 9/18
U.S. Cl. 273—1 R **9 Claims**





1. In a question and answer game, game apparatus comprising, in combination:

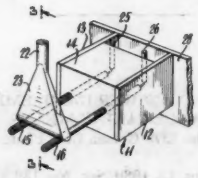
(a) chance-taking means for determining in random manner questions to be asked of participants; and

(b) a question and answer book containing questions to be asked of participants as directed by the chance-taking means, the question and answer book also including answers to each of the questions, the question and answer book including a plurality of index sheets for displaying categories of items, each index sheet being identified by a tab projecting outwardly of the sheets, each index sheet including a listing of particular items within a given category, the items being listed by uniquely identifiable indicia, and a plurality of item pages, each item page being identified by a tab projecting outwardly of the sheets, each item page including a plurality of questions and answers involving that item, each question and answer being uniquely identified by identifying indicia.

4,326,712
POSITIVE CYCLE MECHANISM FOR BOWLING PINSETTER

Thomas M. Camilleri, 277 Avenue W, Brooklyn, N.Y. 11223

Continuation of Ser. No. 898,654, Apr. 21, 1978, abandoned.
This application Jun. 5, 1980, Ser. No. 156,737
Int. Cl.[3] A63D 5/00
U.S. Cl. 273—43 R 8 Claims

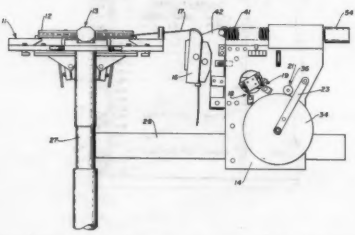


1. A positive cycle means for an automatic pinsetter bowling machine comprising first electrically conductive means attached to the pit cushion, the first means adapted to contact a second electrically conductive means in response to movement of the pit cushion thereby completing an electrical circuit adapted to activate the automatic pinsetter bowling machine cycling mechanism, one of the electrically conductive means comprising at least one flexible member, and the other of the electrically conductive means comprising a surface adapted to contact said at least one flexible member, the surface being joined to a member adapted to delect said at least one flexible member in response to movement of the pit cushion.

4,326,713
RACKET STRINGING APPARATUS AND METHOD

John A. Baiaban, 4142 Graham St., Pleasanton, Calif. 94566

Continuation-in-part of Ser. No. 11,145, Feb. 12, 1979, Pat. No. 4,249,732. This application Dec. 3, 1979, Ser. No. 99,215
Int. Cl.[3] A63B 51/16
U.S. Cl. 273—73 A 16 Claims



1. In a racket stringing apparatus having a racket head holding fixture and a carriage mounted for reciprocation toward and away from said fixture and a string clamp mounted on said carriage for engaging a string drawn through a racket head mounted on said fixture for tensioning said string upon movement of said carriage away from said fixture;

means for establishing a maximum predetermined string tension; said maximum predetermined string tension being such as to effect a pre-stretching of the string;

means for establishing a final predetermined string tension; said final predetermined string tension being significantly less than said maximum predetermined string tension so as to cause contraction of the string to a length significantly less than the length affected by said pre-stretching.

means functioning automatically in response to string tension to limit carriage movement away from said fixture and lock said carriage at the position of said maximum predetermined string tension; and

means functioning automatically on return movement of said carriage from said position and in response to decreasing string tension to lock said carriage against further return movement and at a second position corresponding with said final predetermined string tension.

15. A method of stringing a racket to a final permanent predetermined string tension comprising:

establishing a maximum predetermined string tension; said maximum predetermined string tension being significantly greater than said final predetermined string tension to effect a pre-stretching of said string to a length significantly beyond its length at said final predetermined string tension;

drawing said string across the racket head until said maximum predetermined string tension is reached;

automatically limiting said drawing at said maximum string tension and temporarily locking the string thereat;

decreasing the string tension to permit contraction of said string until said final determined string tension is reached; and

automatically locking said string at said final permanent predetermined string tension.

4,326,714
GAME IMPLEMENT

Robert L. Novack, 6 Oxbow Rd., Medfield, Mass. 02052

Filed Jun. 9, 1980, Ser. No. 157,857
Int. Cl.[3] A63B 49/02
U.S. Cl. 273—73 C 16 Claims

1. A game implement for hitting flying objects, said implement comprising a grip portion and a head portion extending from one end of said grip portion, said head portion comprising a frame portion adapted to have mounted thereon single string means, said frame portion having first and second wall portions forming opposite faces of said frame portion, a first of said faces being disposed outwardly from a plane of said string means in a first direction and a second of said faces being disposed outwardly from said plane in a second direction, said first and second wall portions having different impact characteristics, and indicia on said implement by which a user may perceive which of said wall portions is in a hitting attitude.

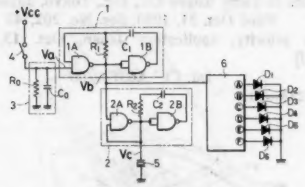
4,326,715
SIMULATED BASEBALL GAME DEVICE

Hiroshi Ito, and Haruyuki Tanaka, both of Mibu, Japan, assignors to Bandai Industry Co., Ltd., Tochigi, Japan

Filed May 7, 1980, Ser. No. 147,687
Claims priority, application Japan, Jun. 2, 1979, 54-74802[U]
Int. Cl.[3] A63F 9/00
U.S. Cl. 273—88 10 Claims

1. A game apparatus comprising a first oscillator, a counter connected to count the oscillations of said first oscillator, a

plurality of light-emitting devices visably arranged on said apparatus and connected to be sequentially energized by said counter, switch means connected to enable said first oscillator



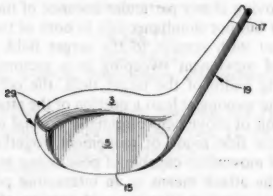
to oscillate a second oscillator, sound generating means connected to said second oscillator, and means applying the output of said first oscillator to control the oscillation of said second oscillator.

4,326,716

POLYURETHANE GOLF CLUB

Francois R. LaCoste, Neuilly, France, assignor to Patentex, S.A, Fribourg, Switzerland

Filed Nov. 15, 1979, Ser. No. 94,749
Int. Cl.[3] A63B *53/04*
U.S. Cl. 273—167 R **10 Claims**



1. A one-piece solid molded polyurethane vulcanizate golf club head having a unitary body including the entire front striking face and exhibiting the properties of a Shore D hardness in the range of about 50 to about 80, an elongation % at break of at least about 150 and not over about 350, a notched IZOD impact (ft. lb./in.) exceeding 4, a resiliency percentage exceeding 40, a recession characteristic exceeding about 0.55 mm, a recovery % between about 50–95, and an amortization % between about 4.5 and about 12; said polyurethane vulcanizate being a cured prepolymer, the prepolymer comprising the reaction product of (i) a diisocyanate selected from an aromatic diisocyanate, an isomer mixture of aromatic diisocyanates, a cycloaliphatic diisocyanate, and a mixture of an aromatic and cycloaliphatic diisocyanate, (ii) a polyalkylene ether glycol, and (iii) a low molecular weight (MW) glycol below about 350, the curing agent being an arylene primary diamine, the mole ratio of component (iii) to (ii) being in the range of about 0.25 to about 3.0, and the mole ratio of component (i) to (ii) plus (iii) being in the range of about 1.5 to 1.0::2.0 to 1.0, and the stoichiometric concentration of curing agent being sufficient to react with about 50 to 110% of the free isocyanato moieties in the prepolymer.

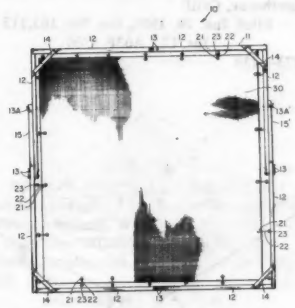
4,326,717

GOLF DRIVING TARGET APPARATUS

Robert A. McClimon, 1451 N. Chester, Indianapolis, Ind. 46201

Filed Feb. 13, 1980, Ser. No. 121,222
Int. Cl.[3] A63B *69/36*
U.S. Cl. 273—181 F **2 Claims**

1. Golf driving target apparatus for stopping a driven golf ball and imparting to the golf ball only a small amount of rebounding force, said apparatus comprising a fixedly positioned frame; a plurality of elastic bands; and a multilayered target, said target having a first, front layer of fine fiberglass mesh, and behind said layer of fine mesh, a second layer of polyethylene film, and behind said second layer, a third layer,



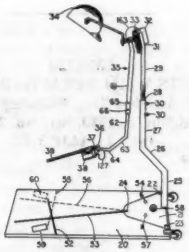
said third layer being of polyethylene film, said target being circumferentially attached to said frame by said elastic bands.

4,326,718

GOLF SWING TRAINING AND EXERCISING DEVICE

Arthur H. Kiehl, 534 Carson Dr,, Hendersonville, N.C. 28739

Filed Aug. 18, 1980, Ser. No. 178,884
Int. Cl.[3] A63B *69/36*
U.S. Cl. 273—183 B **25 Claims**



1. A mechanism useful for improving a golf swing and for exercising muscles used in said swing comprising:

(a) a base member on which the mechanism is supported,

(b) an upright member attached at the base, said upright member having a rigidly mounted post attached at its top to which post a swing arm and a brake adjustable as to tension are attached,

(c) a signal pack on said swing arm having a rod carrying a cam said swing arm having a plurality of switches which are closeable by movement of said cam, each of said switches when closed activates a separate signal which individually can indicate (1) a movement of a simulated club toward and away from a golfer and (2) rotary movement of the wrists, said switches being connected to a source of electrical current said pack having at its distal end

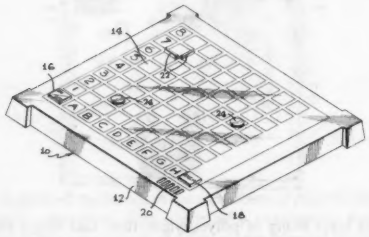
(d) a grip which is movable forwardly and backwardly to move said cam for closing certain of said switches and thereby activate electrical signal means, said grip also being movable laterally to simulate wrist action and to activate signals different from the signals activated by forward and backward movement, thereby denoting the position of a club face during a swing.

4,326,719

ELECTRONIC MAZE GAME

Luan G. Tran, Redondo Beach; Timothy A. Effler, Torrance, and Karen K. Wat, Hawthorne, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jun. 26, 1980, Ser. No. 163,113
Int. Cl.[3] A63F 3/00
U.S. Cl. 273—238 9 Claims



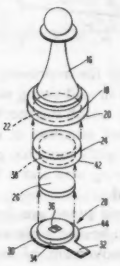
1. An electronic maze game comprising a plurality of switches representing positions on a rectangular field; and circuit means responsive to the switches for controlling the operation of the game, the circuit means including means for establishing and storing the structure of an invisible maze on the field, means for responding to closure of the switches to establish initial and succeeding player positions on the field, means for indicating to a player when his path on the field is obstructed by the maze, and means for randomly designating a position on the rectangular field as containing an invisible treasure.

4,326,720

CHESS PIECES WITH DETACHABLE MARKERS

David Erlich, 406 Audubon Ter., Philadelphia, Pa. 19116

Filed Nov. 3, 1980, Ser. No. 203,420
Int. Cl.[3] A63F 3/02
U.S. Cl. 273—239 10 Claims



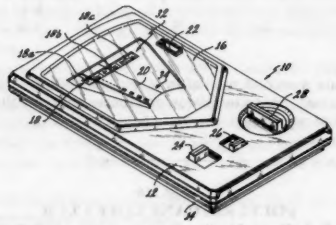
1. A chess piece including a base with a peripheral edge, a marker comprised of a plate, a tab extending laterally therefrom and visibly beyond said peripheral edge of said base and a member upstanding from said plate, a recess in said piece opening through said base and receiving said upstanding member and means removably retaining said uptanding member in said recess whereby when said piece is rocked so that said peripheral edge of said base engages said tab as a fulcrum, said piece is removed and can be moved to other squares of a playing board while the marker remains in the original square to indicate the position of origin of said chess piece which can be reunited with said marker.

4,326,721

TOY HAVING ATTACK OBJECT LOCATED ON ARCUATE MOVING FRAMEWORK

Koichi Minami, and Hiroyuki Watanabe, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Oct. 31, 1980, Ser. No. 202,743
Claims priority, application Japan, Oct. 13, 1980, 55-145411[U]
Int. Cl.[3] A63F 9/00
U.S. Cl. 273—315 11 Claims



1. A toy game which comprises:

a housing;

at least one target member positioned within a target field on said housing;

an attack means movably located on said housing and capable of moving at any particular instance of time in one or the other but not simultaneously in both of two modes of movement with respect to the target field, one of the modes of movement sweeping in a reciprocal manner across the width of the target field, the other mode of movement moving at least a portion of the attack means in a direction of movement essentially normal to the direction of the first mode of movement, together said two modes of movement capable of positioning at least a portion of the attack means in an interacting position with said target member allowing said portion of said attack means to interact with said target member;

a drive means located on said housing;

a drive diverter means operatively associated with both said drive means and said attack means and interposed between said drive means and said attack means, said drive diverter means capable of propagating motion from said drive means to said attack means to move said attack means in one or the other but not simultaneously in both modes of movement.

4,326,722

TARGET FOR TOSSED MARBLES

James Dickens, 28 Westland St., Hartford, Conn. 06120

Filed Feb. 19, 1981, Ser. No. 236,066
Int. Cl.[3] A63B 63/02
U.S. Cl. 273—400 10 Claims

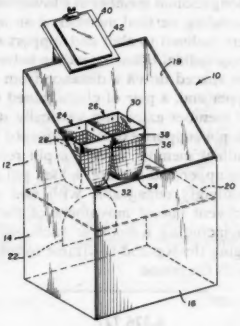
1. A game of skill comprising:

receptacle means, said receptacle means being an elongated structure, said receptacle means having at least one wall means which encloses said structure on all sides, said receptacle means having first and second ends, said first end being closed and forming the base of said receptacle means, said second end being open and forming the top of said receptacle means, said receptacle means having first and second chambers being formed by a horizontal partition means being positioned between said receptacle means first and second ends, said first chamber being enclosed by said first end, said partition means and said wall means, said first chamber being provided with a means of access through said sidewall means, said second chamber being formed by said second end, said partition means, and said wall means;

first basket means, said basket means being cuboidal in shape,

said basket means being enclosed on five sides with an open first end;

second basket means, said basket means being cuboidal in shape, said basket means being enclosed on five sides with an open first end; and



said first and second basket means being positioned in abutting side to side relationship with their first end being unobstructed and co-planar, said first and second basket means being further mounted within said second chamber upon said wall means with said first ends facing said receptacle means second end.

4,326,723

OIL SEAL

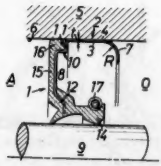
Yoshio Arai, 1-26-26, Koganehara, Matsudo-shi, Chiba-ken, Japan

Filed Sep. 22, 1980, Ser. No. 189,217

Claims priority, application Japan, Oct. 11, 1979, 54-131075

Int. Cl.³ F16J *15/32*

U.S. Cl. 277—153 **2 Claims**



1. In a metal periphery type oil seal provided at its outer peripheral portion with a metallic reinforcement member adapted to be fitted into a stationary member and provided at its inner peripheral portion with a rubber lip adapted to make a sliding contact with a rotary shaft, said reinforcement member being of a substantially L-shaped cross section having an outer peripheral portion and an annular side portion, said rubber lip being integrally formed with an annular rubber plate which is secured to the outer surface of said annular side portion of said reinforcement member;

the improvement wherein said outer peripheral portion has a free end inwardly curved at a radius of curvature considerably larger than the thickness of the metal comprising said metallic reinforcement member and which extends over an angle of not less than 90°, said annular side portion having a bent inner peripheral end, said rubber lip being secured to said reinforcement member in such a manner as to clamp said inner peripheral end of said annular side portion, said outer peripheral portion and said annular side portion being joined to each other through a two-stepped bent portion, said annular rubber plate being formed integrally with an enlarged rubber ring portion secured to the outer surface of said two-stepped bent portion, said enlarged rubber ring portion having an outside diameter larger than the outside diameter of said reinforcement member.

4,326,724

PISTON AND SEAL ASSEMBLY

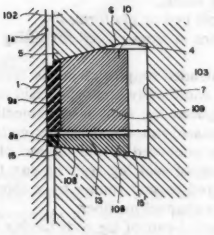
Helmut Gernandt, Cologne, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 20, 1979, Ser. No. 105,732

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1978, 2855438

Int. Cl.³ F16J *9/20, 15/18*

U.S. Cl. 277—171 **2 Claims**



1. A piston-and-cylinder arrangement comprising:

a cylinder forming a cylindrical running surface;

a one-piece cylindrical piston axially reciprocatable in said cylinder and formed with an outwardly open circumferential groove, said groove having a cylindrical root surface spaced from the periphery of said piston by the depth of said groove and a pair of opposite axial flanks of frustoconical configuration defining a mouth of said groove at the periphery of said piston having an axial width less than the axial width of said root surface, the axial width of said groove being greatest at said root surface;

a piston ring disposed in said groove and having a frustoconical flank complementary to and in engagement with one of said axial flanks of said groove along one axial side of said piston ring; and

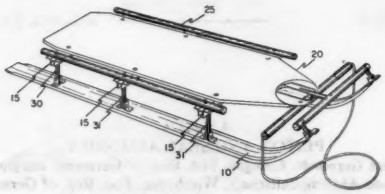
a support ring between the opposite axial side of said piston ring and the other axial flank of said groove, said rings being captive in said groove,

said support ring having a first flank bearing against the other axial side of said piston ring and a second flank of frustoconical configuration complementary to and resting against said other flank of said groove,

said other and second flanks being frustoconical over their entire widths,

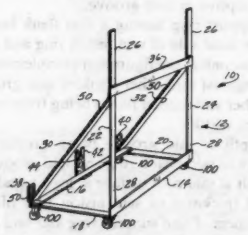
the depth of said groove being greater than the radial width of said piston ring and said groove having an axial width at said root surface at least equal to the maximum axial thickness of said piston ring plus the maximum thickness of said support ring and said other side of said piston ring forming juxtaposed mutually contacting surfaces, at least one of said juxtaposed surfaces being formed with at least one pressure equalizing groove extending generally radially and communicating between the region of said running surface and the region of said root surface of said circumferential groove.

4,326,725
SLEDS
Otto L. Lagervall, 724 N. 34th Ave., Yakima, Wash. 98902
Filed Apr. 10, 1980, Ser. No. 139,125
Int. Cl.³ B62B *13/12*
U.S. Cl. 280—22 **2 Claims**



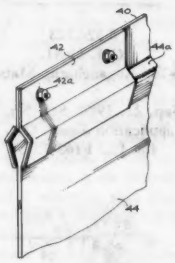
1. A lightweight, wide runner, steerable sled comprising:
a pair of aluminum extruded runners, each having an upwardly turned forward portion and a longitudinally extending guide groove in its bottom surface, said runners being at least 2½ inches wide and having short vertically upward side walls;
a planar support bed or platform;
a steering means at front of bed for tilting and flexing said runners;
at least two extruded support channels, transversely extending beneath and fixedly secured to said bed and side rails;
transversely spaced leg rods, interconnecting said support channels and said runners, the upper ends of said leg rods being rigidly anchored in said support channel;
a rearward pair of said leg rods having their lower ends rigidly secured to said runner by a short section of upwardly open channel member;
at least one medial pair of leg rods having their lower ends hingedly connected to said runners about a longitudinal axis through short sections of upwardly open channel members;
a pair of short leg rods having their lower ends rigidly secured at said upturned forward portion of said runners by upwardly extending channel members, the upper ends of said short legs being flattened;
said steering means including a tubular cross bar having transversely elongated oval holes for pivotally receiving said flattened upper ends of said short legs.

4,326,726
STORAGE RACK
Richard S. Dunchock, Farmington Hills, Mich., assignor to SL Container Corporation, Southfield, Mich.
Filed May 12, 1980, Ser. No. 148,742
Int. Cl.³ B62B *3/10*; A47B *81/00*
U.S. Cl. 280—79.1 A **4 Claims**



1. An automobile top storage rack comprising:
a frame including a first longitudinal member, a second longitudinal member spaced from the first longitudianl member, a pair of spaced apart transverse members integral with and extending between the longitudinal members, a pair of spaced apart vertical members having an upper end and a lower end integral with and extending vertically upward from the first longitudinal member, a pair of inclined side members, each side member affixed to the second longitudinal member at a lower end and affixed to a corresponding vertical member at an upper end, the side members inclined to abut and support a rear wall of the top, a longitudinal brace extending between the vertical members spaced down a distance from each vertical members upper end, a pair of cleats joined to the second longitudinal member extending vertically upward therefrom, a lock pin support extending upward from the second longitudinal member having a pin receiving recess formed in an upper end thereof, a lock pin affixed to the top being slidingly engageable with said pin receiving recess to prevent lateral movement of the top, and an elastic cord including a hook at each end thereof, the hooks engaging the top and the frame to bias the top into abutment with the frame.

4,326,727
MUD GUARD
Gregory Rock, El Monte, Calif., assignor to Erik M. Arnhem, Los Angeles, Calif.
Continuation-in-part of Ser. No. 14,984, Feb. 26, 1979, abandoned. This application Jul. 6, 1979, Ser. No. 55,693
Int. Cl.³ B62D *25/18*
U.S. Cl. 280—154.5 R **5 Claims**



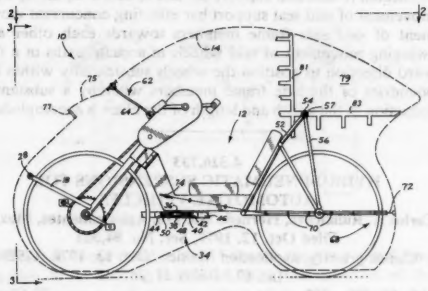
1. In a mud guard assembly for a vehicle, comprising
(a) a first elongated bracket section, including an apertured upper straight part and a lower part extending outwardly and then inwardly thereof;
(b) a plurality of second bracket sections each of which including an apertured upper straight part, and a lower part extending outwardly and then inwardly thereof, the combined lengths of the second bracket sections being less than that of the first bracket section and are joined thereto back-to-back and spatially apart, so that the first bracket section together with the second bracket sections form bifurcating converging sections;
(c) mounting means passing through the apertures of the first and second bracket sections for mounting of said assembly to the chassis of the vehicle behind a rear wheel thereof;
(d) mud guarding means removably mounted between said sections by lateral insertion within the converging sections of the joined first and second bracket sections which separate negligibly on such insertion thereof.

4,326,728
FAIRING FOR GROUND-TRAVELLING VEHICLE
Fred G. Tatch, 3145 Onyx St., Eugene, Oreg. 97405
Filed Apr. 30, 1980, Ser. No. 145,577
Int. Cl.³ B62J *17/00*
U.S. Cl. 280—289 S **5 Claims**

1. Aerodynamic fairing apparatus for use on a ground-

travelling vehicle such as a bicycle and the like having an elongate frame, said apparatus comprising

an elongate fairing including a framework encompassing side and top portions of the vehicle, said fairing having an upright aerodynamic center of force axis between front and rear ends of the fairing,



mounting means mounting said framework on the vehicle frame for pivoting thereon about a substantially upright axis positioned forwardly with respect to said center of force axis, and

biasing means interposed between said framework and the vehicle frame to urge the fairing yieldably toward a position of longitudinal alignment with the vehicle frame.

4,326,729

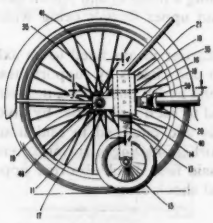
BICYCLE TRAINING WHEEL BRACKET SUPPORT

Edwin E. Luckowski, 119 Marion Ave., and Lester M. Bainbridge, 213 Charles St., both of Belle Vernon, Pa. 15012

Filed Jul. 16, 1980, Ser. No. 169,424

Int. Cl.³ B62H *1/12*

U.S. Cl. 280—304 **14 Claims**



1. Apparatus for attachment to a bicycle for supporting an apertured training wheel bracket at a desired height, comprising:

(a) a brace member having a first portion apertured to accommodate the threaded end portion of a bicycle rear wheel axle, and a second portion comprising a torque arm having a forked extremity for embracing a bicycle frame;

(b) a housing secured between the first and second portions of the brace member;

(c) a substantially vertically extending sheath secured within the housing for receiving the training wheel bracket, said sheath having a transversely disposed aperture extending therethrough and situated for alignment with a selected one of the bracket apertures;

(d) a movable locking pin supported within the housing for substantially horizontal movement into the sheath aperture and a selected one of the bracket apertures, said locking pin being spring-biased into said apertures for locking the bracket at the desired height; and

(e) means extending through an opening in the housing for manually moving the locking pin out of the bracket aperture against the spring bias for permitting movement of the training wheel bracket within the sheath for alignment of another selected one of the bracket apertures with the sheath aperture.

4,326,730

QUICK TRANSFER TOW BAR

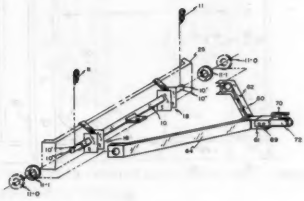
Dan Tomen, 86 Paddock Green Cres., London, Ontario, Canada (N6J 3P7)

Continuation-in-part of Ser. No. 906,976, May 17, 1978, Pat. No. 4,196,919. This application Dec. 11, 1979, Ser. No. 102,406

The portion of the term of this patent subsequent to Apr. 8, 1997, has been disclaimed.

Int. Cl.³ B60D *1/00*

U.S. Cl. 280—502 **9 Claims**



1. A tow bar comprising a hitch and a tow bar assembly in combination:

(a) the hitch adapted for attachment to a bumper of a motor vehicle, the hitch including a draft bar wherein the improvement comprises an extended draft bar having fixtures at either end, and hitch assemblies for mounting the draft bar near each of its ends to the vehicle bumper wherein the hitch assembly comprises:

(i) a generally elongated U shaped member including an essentially flat spine adapted to rest in facing relationship against said bumper, and a pair of parallel arms extending from said spine in a direction away from said bumper, each of said arms having an aperture therethrough for receiving the ends of said draft bar;

(ii) two adjacent finger members mounted at the upper regions of the U shaped member to define between them and the spine an open slit that extends from the spine toward the distal ends, said slit adapted to accept a link of a chain;

(iii) a lever member having a first and a second end; means for pivotally attaching said first end to upper distal regions of said arms whereby said second end swings in a plane between said arms and parallel thereto from a lower position below and beyond the distal ends of said arms to an upper position above the upper edge of said spine; a depending member pivotally mounted on said lever member between said second end and said pivotally attaching means, said depending member having a slot therein;

(iv) upper and lower chains, each chain having attachment means at one end adapted for respective engagement with the automobile, the upper chain adapted to have one link mate into the upper slit, the lower chain having one of its links adapted to enter into said slot whereby on movement of the lever member from its lowest to its upper position the lower chain is caused to be pulled tight and to enwrap the draft bar and to urge the draft bar toward the spine, and into binding engagement with segments of each arm which define in part the aperture.

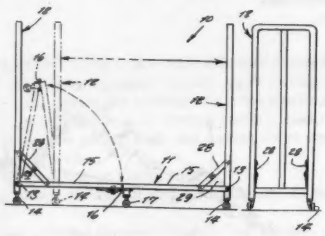
(b) the tow bar assembly including a first straight piece with distal and proximate ends, means on the distal ends for rigid attachment to one of said fixtures, a second straight piece with distal and proximate ends, and means for affix-

ing the proximate ends of both straight pieces together and means on the distal end of the second straight piece for rigid attachment to said other fixture, and trailer hitch attachment means near the proximate ends adapted for attachment to another trailer hitch.

4,326,731
FOLDING CART

Stephen Woychio, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Oct. 1, 1979, Ser. No. 80,178
Int. Cl.³ B62B *3/02*
U.S. Cl. 280—641 **2 Claims**

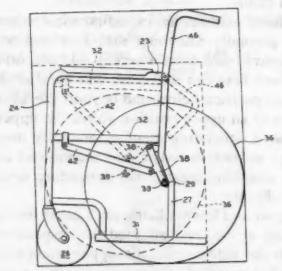


1. A folding cart comprising an assembly having a horizontal platform pivotally connected at a first end to a vertical end frame in combination with a similar assembly having a platform and vertical end frame wherein said assemblies are attached at second ends by a connector including means pivotal about a horizontal axis whereby the second ends may be raised pivotally relative each other and said end frames further including end wheels at the first ends of said platforms and central wheels at the said second ends of said platforms, wherein said connector also includes swivel means providing pivotal motion of one of said assemblies about a vertical axis.

4,326,732
FOLDABLE WHEELCHAIR

John C. Gall, Chicago, and Richard D. Meharg, Wheaton, both of Ill., assignors to Sears, Roebuck and Co., Chicago, Ill.

Filed Sep. 8, 1980, Ser. No. 185,116
Int. Cl.³ B62B *11/00*
U.S. Cl. 280—642 **13 Claims**

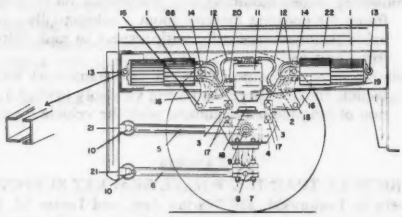


1. A foldable wheelchair comprising a pair of independent side frame members each including front and rear legs and horizontal upper and lower members connecting said front and rear legs, a seat support bar extending between respective front and rear legs and arranged for vertical movement relative to said legs substantially in the plane of a side frame member, a flexible seat carried by said seat support bars and extending transversely of said bars, a pair of X-brace members extending diagonally and transversely of said side frame members, said brace members being pivotally connected at their upper ends to opposite seat support bars and at their lower ends to opposite lower members of said side frame members, an arm pivotally connected at one end to each rear leg and carrying at its distal end wheel mounting means, a wheel and axle assembly carried by said wheel mounting means, a control link pivotally connected to said seat support bar and to said arm, the upward movement of said seat support bar effecting concurrent movement of said side frame members towards each other and swinging movement of said wheels in arcuate paths in a forward direction to position the wheels substantially within the boundries of the side frame members whereby a substantial reduction in the width and length of the chair is accomplished.

4,326,733
HYDRO-PNEUMATIC SUSPENSIONS FOR AUTOMOTIVE VEHICLES

Carlos A. Rubalcava, Hornedo No. 116, Aguascalientes, Mexico

Filed Oct. 12, 1979, Ser. No. 84,311
Claims priority, application Mexico, Oct. 13, 1978, 175201
Int. Cl.³ B60G *11/26*
U.S. Cl. 280—708 **20 Claims**



1. A hydro-pneumatic suspension for an automotive vehicle having a plurality of wheels, comprising:

a chassis having two C-shaped sections which face each other forming a housing and which have upper and lower flanges, said upper flanges being wider than said lower flanges;

at least one carrier means fixed to an axle for a wheel and coupled to said chassis by support means; and

first and second hydro-pneumatic, mechanical shock absorbers coupled to each said carrier by pivoting means and to said chassis and enclosed in said housing, each of said shock absorbers having a spring oriented such that said spring of said first shock absorber opposes said spring of said second shock absorber.

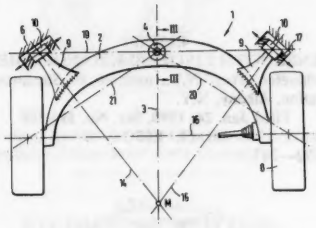
4,326,734
REAR AXLE FOR MOTOR VEHICLES

Wilhelm Kroniger, Friolzheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Stuttgart, Fed. Rep. of Germany

Filed May 2, 1980, Ser. No. 146,165
Claims priority, application Fed. Rep. of Germany, May 4, 1979, 2918009
Int. Cl.³ B60G *11/14*
U.S. Cl. 280—724 **9 Claims**

1. Rear axle assembly for a motor vehicle with a rigid axle beam running crosswise to the lengthwise axis of the vehicle, said axle beam being mounted pivotably to the vehicle body via one support bearing located on the central lengthwise axis of the vehicle for vertically supporting the axle beam relative to the vehicle body and by two trailing arms, connected to the axle beam, via guide bearings, characterized by the fact that said axle beam is rigidly connected with the two trailing arms so as to transmit forces occurring transversely and longitudinally of the vehicle to the guide bearings and to form a one-piece wheel guiding element for rear wheels of the vehicle,

carried by said axle beam, said guiding element having an instantaneous rotational pole that is located rearward of the rotational axis of said wheels carried by said axle beam, with respect to a forward direction of travel, and in that said guide



bearings are constructed so as to be more rigid in a radial load direction of the bearing than in an axial load direction of the bearing, permit a roll steering effect of the rear wheels, and form a horizontal pivot axis relative to said forward direction of travel, during straight line travel of the vehicle.

4,326,735

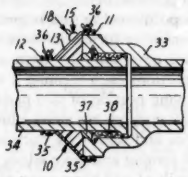
MOLD USEFUL IN SEALING LEAKS IN PIPES

David N. Hunder, Woodbury, and Harold C. Hervig, Jr., Maplewood, both of Minn., assignors to Minnesota Mining & Manufacturing Company, Saint Paul, Minn.

Filed Oct. 14, 1980, Ser. No. 196,390

Int. Cl.[3] F16L *55/18*

U.S. Cl. 285—15 11 Claims



1. A mold useful in sealing fluid leaks in pipes, said mold comprising:

a sleeve of an elastomeric material dimensioned to fit around a pipe, and extend longitudinally to both sides of a leak in a pipe, said sleeve having a resin injection port and a fluid venting port located such that, when said mold is extended around said pipe and longitudinally to both sides of said leak, said fluid venting port is at the top of said pipe,

means for securing said mold to itself after being placed around said pipe,

pressure-relief means on said fluid venting port to permit escape of fluid at a predetermined pressure above the pressure in said pipe,

sealing means on said injection port to prevent escape of resin at a pressure above said predetermined pressure,

said mold being at least in part expandable under a pressure less than said predetermined pressure.

4,326,736

SWIVEL JOINT FOR REVERSE CIRCULATION DRILL

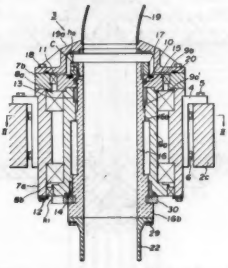
Hiroshi Kusumi, Honjo, and Masami Wada, Tsuchiura, both of Japan, assignors to Hitachi Construction Machinery Co. Ltd., Tokyo, Japan

Filed Apr. 14, 1980, Ser. No. 142,165

Claims priority, application Japan, Apr. 16, 1979, 54-45339; Apr. 16, 1979, 54-45341

Int. Cl.[3] F16L *27/00*

U.S. Cl. 285—98 7 Claims



1. A swivel joint for a reverse circulation drill, comprising:

a non-rotatable outer housing;

a center housing rotatably mounted in said outer housing through thrust and radial bearings;

an inner housing vertically slidably fitted in said center housing and interiorly defining a passage for muddy water; and

an upper lid having a bent pipe for conducting muddy water from said inner housing to a suction hose;

said inner housing having at the upper and lower ends thereof flanged projections extending toward said center housing for limiting the sliding movement of said inner housing;

said inner and center housings having respectively on the outer and inner peripheries thereof engaging portions which are rotationally lockable with each other within the range of the vertical sliding movement of said inner housing for integrally rotating said inner and center housings:

said inner housing, after imposition and release of a downward thrust, being slid upward within the range of a space between the lower end of said center housing and the flanged projection at the lower end of said inner housing subject to an upward thrust acting thereon, thereby preventing transmission of said upward thrust to said center and outer housings.

4,326,737

TUBE COUPLING ASSEMBLY

Ernesto Lehmann, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Feb. 21, 1980, Ser. No. 123,204

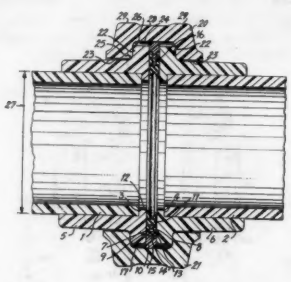
Claims priority, application Switzerland, Feb. 23, 1979, 1799/79

Int. Cl.[3] F16L *17/06*

U.S. Cl. 285—112 12 Claims

1. A coupling assembly for joining together the ends of a pair of tubes, particularly tubes made of plastic material, comprising: flange bushings defining a pair of planar radial flanks extending generally perpendicularly to the center lines of said pair of tubes and means attaching said bushings to said tubes; sealing means sealingly engaging said radial flanks, said sealing means having a generally annular configuration and an outer circumferential face; said radial flanks and said annular sealing means being structured so that said annular sealing means are held axially fixed between said radial flanks but radially adjustably movable relative thereto to allow for radial adjustment in the position of said sealing means; said outer circumferential

face of said sealing means having a diameter which is at least as large as the outermost diameter of said radial flanks; and annular clamping means extending circumferentially about said flange bushings and said sealing means to provide a radial clamping force and to circumferentially engage said sealing means to effect radial adjustment of the position thereof; said clamping means comprising a pair of generally semicircular shells, resilient pawl means for circumferentially joining said



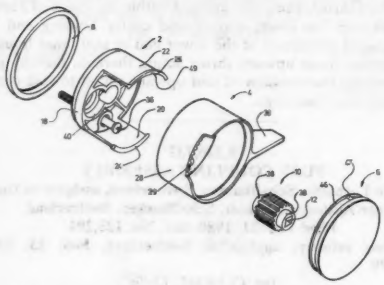
shells together and radially inner engaging means for engaging said outer circumferential face of said sealing means to effect radial positioning thereof; said sealing means including an outer centering ring having a T-shaped profile, and an inner sealing ring with a lip seal directed radially inwardly of said assembly and formed with a U-shaped profile, with a radial web being provided on said centering ring, said radial web engaging in an outer circumferential groove of said sealing ring.

4,326,738

DOOR KNOBS AND LEVERS

Barry N. Loftus, 15 Willsmere Rd., North Kew, Victoria, and Hugh J. Young, 2 Ormond St., Kensington, Victoria, both of Australia

Filed May 3, 1979, Ser. No. 35,691
Int. Cl.³ E05C *1/16*
U.S. Cl. 292—172 **34 Claims**



1. Door furniture for actuating a spindle operated door lock in a door having a free, said furniture comprising:

a first component for fixedly mounting on the face of the door;

a second component which is rotatable relative to the first component; and

coupling means for coupling rotational movement of the second component to the spindle of the door lock;

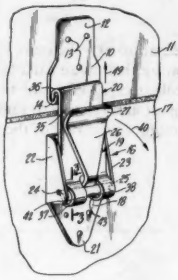
the first component being located substantially entirely within the second component, wherein the first component includes first and second cylindrical bearing surfaces spaced from one another in the axial direction relative to the spindle of the lock, the second component includes complementary surfaces formed on the interior of the second component, the cylindrical bearing surfaces engaging with the complementary surfaces, and the second component is rotatable about the axes of said surfaces.

4,326,739

FASTENER WITH PIVOTABLE HANDLE MEMBER

Ernest Schlueter, Troy, N.Y., assignor to Simmons Fastener Corporation, Albany, N.Y.

Filed Jan. 24, 1980, Ser. No. 114,958
Int. Cl.³ E05C *5/00*
U.S. Cl. 292—247 **2 Claims**



1. A fastener comprising a fixed hasp adapted to be fixed to one panel and a lever assembly adapted to be connected to a second panel, said lever assembly comprising:

a formed sheet metal bracket member having a base portion adapted to be connected to said second panel and opposite sides, each of said sides having an opening;

a formed sheet metal handle member having an elongated handle portion to be grasped and operated by the user, a paddle portion which extends at both sides from said handle member to form, in plan view, a "T" shape forming opposite wing portions with said lever portion with opposite shaft portions extending from said wing portions and rotatably positioned in said respective side openings;

a moving hasp member formed of wire and having an end portion to hook onto said fixed hasp, a body portion, and two curved portions each forming a bore and each bore containing a wing portion of said paddle portion;

wherein said shaft portions are along a line of turning of said handle member and said wing portions are eccentric to said center of turning and have edges which cam against the internal walls of said bores upon rotational movement of said handle member to open or close said fastener.

4,326,740

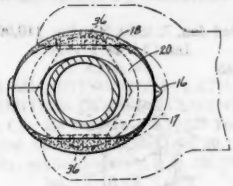
SECURITY SEAL

Richard S. Guiler, Stewartsville, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Jul. 3, 1980, Ser. No. 165,700
Int. Cl.³ B65D *55/02*; F16B *41/00*
U.S. Cl. 292—307 B **6 Claims**

1. A seal for a pipe coupling nut or the like, comprising a housing formed in two portions, said portions being shaped to closely enclose the nut when assembled with each other and having means enabling the portions to be non-removably fastened together, said housing portions being formed of a pigmented plastic of a type that forms a white blush on the surface

when permanently deformed, said housing portions having a plurality of inward protrusions on the innersurface positioned



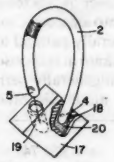
to be compressed against the nut when the seal is gripped by a tool that applies a compressive force thereto.

4,326,741

DYE FILLED SECURITY SEAL

Dennis C. W. Wilson, Tijeras, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 18, 1980, Ser. No. 170,253
Int. Cl.³ B65D *33/34*
U.S. Cl. 292—307 R **8 Claims**



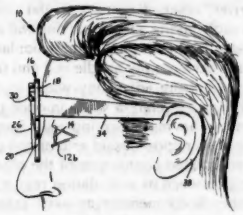
1. A security sealing device for providing visible indication of tampering or removal from an object to which it is secured comprising an elongate hollow thin-wall tubing for retention in a hole in the object and having two opposed ends for preventing removal from the hole or forceful deformation of said tubing without rupture of said wall, end portions of said tubing being closed to provide within the tubing a pressurizable chamber, and within the chamber a dye at greater than atmospheric pressure for permenently and visibly staining outer surfaces of said tubing upon rupture of said thin wall and exudation of dye from the chamber to said outer surfaces.

4,326,742

METHOD AND APPARATUS FOR INSERTING AND REMOVING SOFT CONTACT LENS

W. Frank Ingram, P.O. Box 23, Griffin, Ga. 30224

Filed Apr. 18, 1980, Ser. No. 141,602
Int. Cl.³ A61F *9/00*
U.S. Cl. 294—1 CA **18 Claims**



1. In an apparatus for inserting and removing soft contact lens:

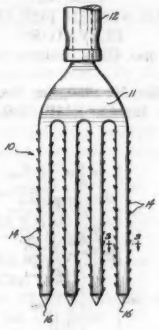
a frame for head support on the head in front of the eyes and forehead of a person, support means mounted on the frame to move selectively from in front of one eye to the other, adjustable means for limiting the extent of moving of said support means for adjusting same to position the arm substantially in front of the center of the cornea of the eye, said support means removably retaining selectively a contact lens insertion means and a removal means thereon.

4,326,743

WEEDING TOOL

Kazutaka Tamura, 1801 17th Ave. South, Seattle, Wash. 98144

Filed Jun. 30, 1980, Ser. No. 164,352
Int. Cl.³ A01B *1/16;* A01D *9/02*
U.S. Cl. 294—55.5 **4 Claims**



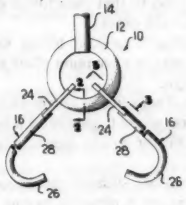
1. A weeding fork comprising a plurality of substantially parallel, elongated tubular tines oriented in their flat dimension to extend in substantially coplanar alignment, a handle means to which said tines are attached, said tines each having a plurality of teeth projecting outwardly and rearwardly from each lateral side thereof for removing small rootlets from soil, the teeth along each side of each tine being alternately displaced on opposite sides of the plane of alignment of said tines in a cross-cut configuration.

4,326,744

WORK HOOK DEVICE

William W. Long, III, Hagerstown, Md., assignor to Kennecott Corporation, Stamford, Conn.

Filed Mar. 7, 1979, Ser. No. 18,421
Int. Cl.³ B66C *1/00*
U.S. Cl. 294—81 R **4 Claims**



1. A work hook device comprising a support and a hook unit adjustably carried by said support, said hook unit including a hanger portion and a hook portion, said hanger portion being engageable over said support, and said support and hanger portion having cooperating surfaces for locking said hanger portion in an adjusted position on said support, said support having a generally trapezoidal cross section and said hanger

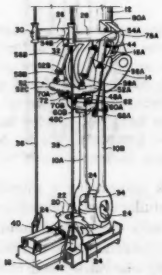
portion having a transverse opening receiving said support with said transverse opening wedgingly receiving said support, said transverse opening being elongated in a direction opposite from that effecting wedging for faciliating release of said cooperating surfaces and movement of said hanger portion along said support, said opening including an extension of a size in two directions greater than the maximum dimension of said trapezoidal cross section to permit rotation of said hanger portion about said support.

4,326,745

LINK CONTROL SYSTEM FOR USE WITH DUAL ELEVATORS

William C. Guier, Tulsa, Okla., assignor to Guier and Affiliates, Inc., Tulsa, Okla.

Filed Jun. 30, 1980, Ser. No. 164,002
Int. Cl.³ E21B *19/02*
U.S. Cl. 294—90 **7 Claims**



1. An improved apparatus for handling stands of pipe in a drilling rig when connecting and disconnecting the stands in making up or pulling a drilling string employed in drilling a borehole wherein the drill pipe stands have enlarged tool joints providing shoulders thereon, the drilling rig having a rig floor over the borehole, comprising:

a lifting member elevationally positionable over a borehole;

a pair of links pivotally supported at their upper ends to said lifting member, the links have open loops at their lower ends;

means extending from said lifting member to selectively move said links so that their lower ends move towards or away from each other;

means extending from said lifting member to selectively pivot said links in a common plane from the vertical to an inclined angle;

means to guide said lifting means and thereby said links in vertical arrangement relative to a borehole;

horizontal elevator guide means positioned adjacent the borehole;

a pair of elevators slidably positionable on said elevator guide means, each elevator having opposed link attachment horns extending therefrom adaptable to receive the loops at the lower end of said links, each elevator having means to receive a length of drill pipe therein and to engage the drill pipe tool joint shoulders whereby each elevator may support a length of drill pipe;

means to shift said elevator in position on said guide to engage and support a string of drill pipe;

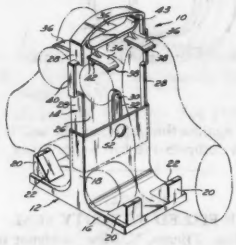
and means to laterally position the lower ends of said links to selectably engage or disengage the said elevator horns.

4,326,746

ROLLERSKATE CARRIER

Lawrence A. Grihalva, 10690 La Bahia, Fountain Valley, Calif. 92708

Filed Jan. 7, 1980, Ser. No. 110,001
Int. Cl.³ A47F *7/16*
U.S. Cl. 294—146 **14 Claims**



1. A rollerskate carrier comprising:

a base adapted to be carried by a user;

a member mounted on said base for positioning one end of said rollerskate at a fixed location relative said base; and

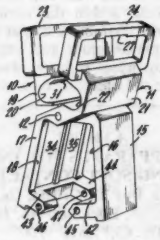
arcuate resilient fastener means for snapping the other end of said rollerskate onto said base, said fastener means flexing in a direction generally parallel to the longitudinal dimension of said rollerskate in response to a force on said rollerskate in a direction generally perpendicular to said dimension to releasably mount aid other end on said base.

4,326,747

SKI CARRIER

Robert J. Finnegan, Williston, Vt., assignor to Barreca Products Co., Inc., Shelburne, Vt.

Continuation of Ser. No. 20,747, Mar. 15, 1979, abandoned. This application Nov. 25, 1980, Ser. No. 210,244
Int. Cl.³ B65D *71/00;* **A45F** *5/00*
U.S. Cl. 294—147 **28 Claims**



1. A ski carrier, comprising two similar unitary tong-like body members each having a handle at one end and a jaw at the opposite end, said members having an articulated connection on an axis located between the handle end and the jaw end, the handles being in abutting adjacency when in closed position and in angularly spaced relation when in open position, one of said body members having a continuously framed axially extensive opening at its region of said articulated connection, the region of said articulated connection of the other of said body members having between its articulation region and one of the ends of said other body member an axial extent which is of substantially the axial extent of the framed opening, the articulated connection of said body members being at both axial limits of the framed opening, each of the jaws having a ski-receiving cavity and the cavities of said jaws facing each other to define when in closed position a peripherally enclosed gen-

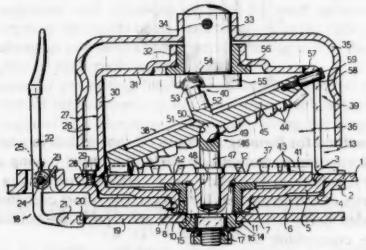
erally rectangular passage extending parallel to said axis and adapted to contain the combined central cross-section of a pair of skis in face-to-face relation when said body members are in closed position.

4,326,748

DEVICE FOR ADJUSTING THE RELATIVE ANGULAR POSITION OF TWO ELEMENTS

Enzo Brussasco, C.so Re Umberto 64, 10129 Torino, Italy

Filed Apr. 16, 1979, Ser. No. 30,173
Claims priority, application Italy, Apr. 28, 1978, 67969 A/78
Int. Cl.³ A47C *1/025*
U.S. Cl. 297—362 **14 Claims**



1. An adjustment device for adjusting the relative angular position of first and second elements, particularly first and second brackets articulated to one another by means of a pivot and, the first and second elements being rigidly connectable to the cushion and to the back of a seat, respectively common, preferably a seat of a motor vehicle, the said pivot being angularly coupled to said second element and forming the output shaft of a gearbox rigidly connected to the said first element and comprising an input shaft, coaxial to said output shaft and angularly controllable with respect to the said gearbox by means of a control member, and a kinematic chain transmitting the motion between the said input shaft and said output shaft, wherein said kinematic chain comprises a first and second gear facing one another, the said first gear being a face gear and angularly connected to the said output shaft and the said second gear having a number of teeth different from that of the said first gear and being slanting with respect to said first gear so as to engage a section of its periphery; support means for supporting the said second gear in a position of oscillation about a substantially central point of the said gear box, the said support means comprising a spherical support cooperating with a first hemispherical seating formed centrally on the said second gear, the said spherical support comprising a pin coaxial to the said two shafts and extending from the said first gear to the said second gear; connection means for angularly connecting the said second gear to the said gearbox; and crank means interposed between the said second gear and the said input shaft to convert and angular movement of the input shaft into an oscillation of the said second gear about the said central point and in contact with the said first gear.

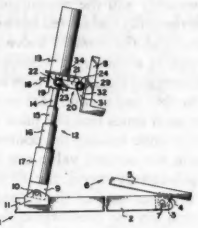
4,326,749

COUPLING CONSTRUCTION

Fredrick L. Bender, Saginaw, Mich., assignor to Bender's Sales & Service, Inc., Saginaw, Mich.

Filed Dec. 3, 1979, Ser. No. 99,839
Int. Cl.³ B60P *1/28*; F01B *15/04*
U.S. Cl. 298—22 R **11 Claims**

8. In a vehicle having a frame member, a body member pivoted on said frame member for rocking movement about an axis between raised and lowered positions, and a ram pivotally connected to and reacting between said members and being extensible and retractable along its longitudinal axis to rock said body member about said axis, said body member in its lowered position being capable of vertical vibration, the improvement wherein the connection of said ram to one of said members comprises coupling means constituting at least one link having a pivotal connection at one end directly and only to



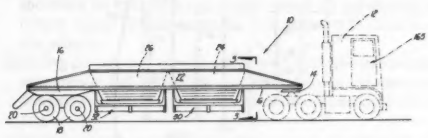
said ram and a pivotal connection at its other end directly and only to said one of said members, said link extending transversely of the longitudinal axis of said ram and enabling limited vibratory movement of said body member in its lowered position without extension or contraction of said ram.

4,326,750

GATE ASSEMBLY AND CONTROL ASSEMBLY THEREFOR

Glen F. Rosenbaum, Elk Point, S. Dak., assignor to CMI Corporation, Oklahoma City, Okla.

Filed Dec. 17, 1979, Ser. No. 104,316
Int. Cl.³ B60P *1/56*
U.S. Cl. 298—35 M **24 Claims**



1. In a material dispensing vehicle having a pressurized fluid source, a hopper with a bottom discharge opening for discharging the material therefrom, and a gate assembly operably connected to the vehicle such that the gate assembly is moveable between one of a closed position and an opening position, in the closed position the gate assembly preventing discharge of material from the hopper via the bottom discharge opening, in the open position the gate assembly allowing discharge of the material from the hopper via the bottom discharge opening, the improvement wherein the gate assembly comprises:

a first gate member;

a second gate member;

connecting means for pivotably connecting the first gate member and the second gate member to the vehicle such that the first and second gate members are moveable between the closed position and the open position;

a gate moving assembly operably connected to the first and second gate members for moving the first and second gate members between the closed position and the open position; and

a control assembly operably connected to the gate moving assembly and the pressurized fluid source, the control assembly having a first operational mode and an alternative second operational mode, in the first operational mode of the control assembly the first and second gate members being positioned and maintained in the closed position via the pressurized fluid source and the gate moving assembly, in the second operational mode the control assembly being selectively activated to move the

first and second gate members between one of the closed position and the open position by the pressurized fluid source and the gate moving assembly, the control assembly comprising:

a pilot valve having a first state and a second state;

a control valve operably connected between the gate moving assembly and the pressurized fluid source, the pilot valve operably connected between the pressurized fluid source and the control valve so as to place the control valve in a condition wherein the control valve directs pressurized fluid to the gate moving assembly to maintain the first and second gate members in the closed position at such times that the pilot valve is in the first state thereof while leaving the control valve in a condition wherein the control valve can be selectively activated to selectively move the first and second gate members between one of the closed position and the open position via the pressurized fluid source and the gate moving assembly at such times that the pilot valve is in the second state thereof.

4,326,751

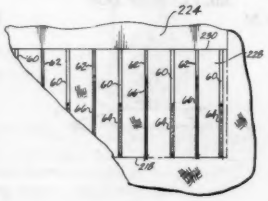
BLASTING TO A HORIZONTAL FREE FACE WITH MIXING OF FRAGMENTS

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale Inc., Grand Junction, Colo.

Continuation of Ser. No. 76,287, Sep. 17, 1979, abandoned. This application Oct. 24, 1980, Ser. No. 200,136

Int. Cl.³ E21C *41/10*

U.S. Cl. 299—2 **123 Claims**



1. A method for forming an in situ oil shale retort in a retort site within a subterranean formation containing oil shale, such an in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale comprising the steps of:

excavating formation to form at least one void in the subterranean formation leaving zones of unfragmented formation above and below such a void, such a zone of unfragmented formation having a substantially horizontal free face adjoining the void;

forming substantially vertical blastholes in at least one of such zones of unfragmented formation for forming at least one array of spaced apart blastholes;

placing explosive into such blastholes for forming a substantially horizontal array of main explosive charges and at least one substantially horizontal array of satellite explosive charges, wherein each of the satellite explosive charges has a scaled point charge depth of burial substantially equal to the scaled point charge depth of burial of each of the main explosive charges and the actual depth of burial of each of the satellite explosive charges is less than the actual depth of burial of each of the main explosive charges; and

detonating explosive in the blastholes in a single round of explosions for explosively expanding at least one of the zones of unfragmented formation toward such a void to form a fragmented permeable mass of formation particles containing oil shale in the in situ oil shale retort.

4,326,752

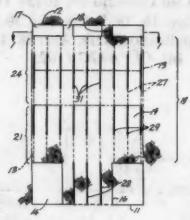
METHOD FOR FORMING AN IN SITU OIL SHALE RETORT

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Mar. 24, 1980, Ser. No. 133,409

Int. Cl.³ E21C *41/10*

U.S. Cl. 299—13 **53 Claims**



1. A method for forming an in situ oil shale retort in a subterranean formation containing oil shale, the retort having a top boundary, a bottom boundary, and vertically extending side boundaries of unfragmented formation, the retort containing a fragmented permeable mass of formation particles containing oil shale, comprising the steps of:

excavating a lower level void adjacent the bottom boundary of the in situ oil shale retort;

excavating an upper level void above the lower level void, leaving an intermediate zone of unfragmented formation between the lower level void and the upper level void;

explosively expanding a lower portion of the intermediate zone downwardly towards the lower level void for forming a first moiety of a fragmented mass of particles in the retort, the available volume of the lower level void being less than an unlimited void relative to the volume of formation explosively expanded toward the lower level void, leaving a void space between the top of the first moiety of the fragmented mass and the bottom of an upper portion of the intermediate zone, the volume of the void space being about the same as the void volume in the upper level void; and

explosively expanding the upper portion of the intermediate zone upwardly towards the upper level void and downwardly towards the void space for forming a second moiety of a fragmented mass of particles in the retort.

4,326,753

ADVANCE MECHANISM, PREFERABLY FOR MINING MACHINES

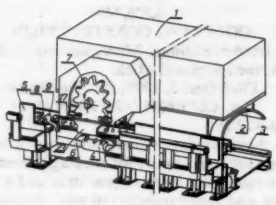
Jan Rynik, ul. Kalinowa 16, Gliwice, Poland

Filed Jun. 11, 1980, Ser. No. 158,586

Claims priority, application Poland, Jun. 12, 1979, 216335

Int. Cl.³ E21C *29/02*

U.S. Cl. 299—43 **8 Claims**



1. A rack for mounting on a segmented mine wall face con-

veyor or the like and for assisting the movement of a drum mining machine or the like along such segmented conveyor, the rack comprising:

a plurality of rack segments alinged substantially in an end-to-end relationship, each rack segment provided with a plurality of substantially equidistantly spaced pins oriented substantially perpendicularly to the longitudinal axis of the rack, the pins adapted for meshing with and driving engagement with a pinion or the like of the drum driving machine;

means for rotatably mounting each rack segment on the conveyor about a substantially horizontal axis, said mounting means connected to each rack segment at a point intermediate between the ends of the rack segment;

a connection link interposed between two adjacent rack segments and rotatably secured to each adjacent rack segment by means of an outermost pin of the rack segment about an axis substantially parallel to the axis of the spaced pins of each rock segment; and

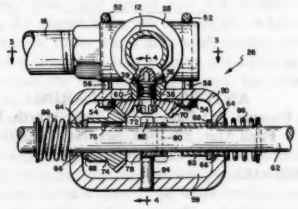
means for permitting limited extension and limited contraction of said connection link relative to each adjacent rack segment in a direction substantially along the longitudinal axis of the rack.

4,326,754

VALVE AND ACTUATOR ASSEMBLY FOR RAILROAD CAR AIR BRAKE SYSTEM

Bruce L. Harding, Holden, Mass., assignor to Smith Valve Corporation, Westboro, Mass.

Filed Sep. 29, 1980, Ser. No. 191,829
Int. Cl.³ B60T *17/04*
U.S. Cl. 303—81 **7 Claims**



1. For use in an air brake system for a railroad car having at least three pipe sections for carrying compressed air, a valve and actuator assembly manually operable from opposite sides of the car for selectively interconnecting said pipe sections, comprising:

a valve housing having three ports leading to an interior valve chamber containing a ball element, said ports being adapted for connection to said pipe sections, said ball element being rotatable within said valve chamber about the axis of an operating stem protruding therefrom through said valve housing to the exterior thereof, said ball element having communicating passages arranged to communicate with said ports in any one of four different combinations depending on the rotative displacement of said ball element;

an actuator housing attached to said valve housing and defining an actuator chamber separate from said valve chamber, said actuator housing having an aperture through which the protruding portion of said operating stem is received into said actuator chamber,

a rotatable actuator shaft extending through said actuator chamber in a direction perpendicular to said operating stem, with opposite ends of said actuator shaft protruding through opposite sides of said actuator housing;

gear means contained within said actuator chamber for drivingly connecting said operating stem;

operating means for rotatably setting said ball element by rotating said actuator shaft from either side of the railroad car; and

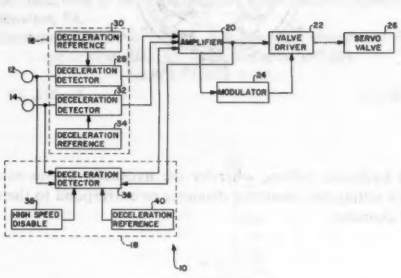
disengageable locking means for resisting inadvertent rotation of said actuator shaft from a selected setting.

4,326,755

DECELERATION CONTROL CIRCUIT

George C. Fretz, III, Cuyahoga Falls, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed May 11, 1979, Ser. No. 38,046
Int. Cl.³ B60T *8/08*
U.S. Cl. 303—96 **14 Claims**



1. The improvement of a deceleration control circuit in a brake control system of a wheeled vehicle for limiting the pressure which may be applied to the brakes of the wheels, comprising:

deceleration detection means receiving an input signal corresponding to instantaneous wheel speed for producing an output signal corresponding to the rate of deceleration of the wheels;

disabling circuit means connected to said deceleration detection means for inhibiting operation of said deceleration detection means at vehicle speeds above a particular level; and

reference circuit means connected to said deceleration detection means for inhibiting said output signal at deceleration rates below a predetermined level.

4,326,756

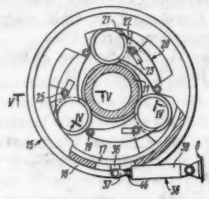
REST FOR DRILLING RIG

Viktor M. Moroz, ulitsa Kommunarov, 6, kv. 6; Nikolai Y. Lezin, prospekt Kosmonavtov, 52, kv. 27; Tengiz A. Pavlov, ulitsa Budapeshtskaya 91, korpus 1, kv. 80, and Vladimir V. Ilmensky, Vitebsky prospekt, 41, korpus 2, kv. 117, all of Leningrad, U.S.S.R.

Filed Mar. 14, 1980, Ser. No. 130,268
Int. Cl.³ F16C *29/02*
U.S. Cl. 308—3.9 **1 Claim**

1. A rest structure for a drilling rig supported on the mast of the rig and comprising: a housing with a central bore provided in the bottom thereof for the passage of a drill rod therethrough, fixed to a lower portion of said mast; a device for centering the drill rod, accommodated in said housing; a rotating mechanism connected with said drill rod centering device; a hydraulic drive means operatively connected with said rotating mechanism; said device for centering the drill rod including: at least three link gears with bearing rollers uniformly circumferentially spaced within said housing, the rollers being mounted on vertical spindles for radial displacement by the action of said hydraulic drive by means of said rotating mechanism and the respective ones of said link gears, and engaging the drill rod by their respective peripheral side surfaces, thus defining the centering diameter, and hydraulic valves underlying said bearing rollers, the bearing rollers being spring-mounted along their respective axes and mounted for axial displacement so that, when the friction between the drill rod

and said bearing rollers attains a preselected value, said rollers follow the drill rod travel in the direction of drill and actuate



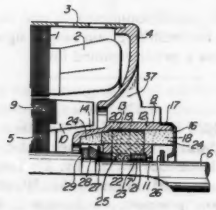
said hydraulic valves, whereby the hydraulic valves exert a force setting the centering diameter to correspond to the drill rod diameter.

4,326,757

BEARING DEVICE FOR ROTARY MACHINES

Sozaburo Ozaki, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 28, 1980, Ser. No. 154,024
Claims priority, application Japan, May 29, 1979, 54-65618
Int. Cl.³ F16C *33/10*
U.S. Cl. 308—121 **4 Claims**



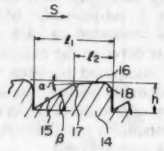
1. A bearing device for rotary machines, comprising a sleeve bearing, a bearing support member for supporting said sleeve bearing, oil reservoirs provided at least on an axially inner side of said bearing support member oil-containing materials provided in said oil reservoirs, oil returning bores communicated with said oil reservoirs formed in said bearing support member, oil guide members at least a part of which are provided in said oil returning bores so as to contact said oil-containing materials to thereby introduce lubricating oil stored in said oil-containing materials to a rotary shaft supporting surface of said sleeve bearing, and an oil slinger provided on the rotary shaft for returning to said oil-containing materials the lubricating oil flowing out in the direction of the axis of the rotary shaft, each of said oil reservoirs provided on the axially inner side of said bearing support being in the form of a groove, said oil reservoirs being provided in substantially the same circumferential positions as said oil returning bores, said oil reservoirs being formed integrally with said bearing support member by a die casting mold.

4,326,758

THRUST BEARING WITH TAPERED LANDS

Shigehiro Nozue, Toyota; Tatsuhiko Fukuoka, Aichi, and Hideaki Sugiura, Okazaki, all of Japan, assignors to Taiho Kogyo Co., Ltd., Aichi, Japan

Filed Nov. 6, 1980, Ser. No. 204,521
Claims priority, application Japan, Dec. 25, 1979, 54-167602
Int. Cl.³ F16C *17/04*
U.S. Cl. 308—170 **5 Claims**



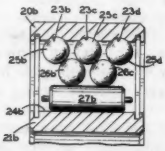
1. A thrust bearing having a central bore for receiving therein a rotating shaft, a bearing face extending around the central bore for making a slide engagement with a slide part of the shaft, and tapered lands circumferentially arranged in series in the bearing face for forming a thrust load-carrying oil film of a wedge shape between the tapered lands and the sliding part of the shaft, wherein each of said tapered lands is formed with a foot surface having a given sloping angle (β) and an upper surface having a gentle sloping angle (α) less than said given sloping angle of said foot surface, said foot surface and said upper surface having therebetween a rounded boundary.

4,326,759

ANTI-FRICTION BEARING

Adam M. Rasmus, 313 Banyan Dr., Lake Worth, Fla. 33461

Filed Mar. 30, 1981, Ser. No. 249,074
Int. Cl.³ F16C *19/49*
U.S. Cl. 308—183 **15 Claims**



1. In an anti-friction bearing having concentric outer and inner races which define radially inwardly-facing and radially outwardly-facing circular raceways, respectively, the improvement which comprises:

three concentric sets of anti-friction bearing members engaged in succession radially between said races in rolling contact with said raceways and with each other, two of said sets of bearing members consisting of balls and the remaining set consisting of rollers, each of said rollers being unsupported except where it has said rolling contact with balls or a raceway;

each of said races being a one-piece annular body, and each of said raceways being a single continuous surface that is case hardened and finish ground and polished to at least a No. 12 microfinish, and the respective raceways of said outer and inner races being concentric with a tolerance not greater than substantially 0.001 inch.

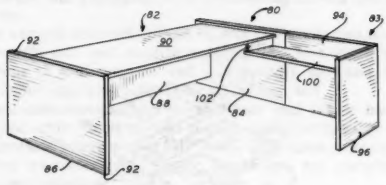
4,326,760
WORK STATIONS OF KNOCK-DOWN MODULAR COMPONENTS

Irwin I. Ziegelheim, 127 Munsey Rd., Emerson, N.J. 07630, and Lawrence Lerner, 201 E. 62nd St., New York, N.Y. 10021

Continuation of Ser. No. 885,351, Mar. 13, 1978, abandoned. This application Jun. 22, 1979, Ser. No. 51,056

Int. Cl.[3] A47B *43/00;* F16B *12/00*

U.S. Cl. 312—257 R 6 Claims



1. A work station comprising:

a work surface;

a pair of side panels;

a cross panel;

securing means for attaching said side panels in spaced relationship to each other and at the ends of said cross panel and directly to said cross panel, with said side panels and cross panel disposed in vertical disposition to form a vertical support for said work surface, and for attaching said work surface directly to said cross panel and between and directly to said side panels;

said securing means being received and located substantially within said panels and cross panel so as not to extend outwardly from said panels and not readily visible in viewing the assembled work station; and where

said side panels, cross panel and work surface being fabricated for shipment in knock-down condition and for on-site assembly by said securing means, the work station further including

an additional work surface;

a pair of additional side panels; and

additional securing means for attaching said additional side panels to each and one of said side panels to form a vertical support for said additional work surface, and for attaching said additional work surface thereto so as to form a run-off for said work surface.

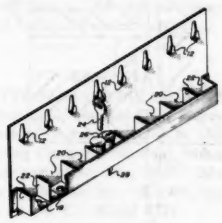
4,326,761
KEY AND LOCK CORE COMBINATION

Samuel Schwartz, Box 96A, Bechtelsville, Pa. 19505

Filed Dec. 10, 1979, Ser. No. 101,824

Int. Cl.[3] B65D *5/50;* A47F *5/08;* A47B *67/02*

U.S. Cl. 312—326 2 Claims



1. A compartmental key and lock core container comprising, as a rigid frame:

(a) a continuous sheet of rigid material containing a series of four right angle bends intermittent its length to form thereby an elongated pocket portion, said pocket containing a first upper lip portion and a second lower lip portion at its edges, said pocket portion being of a size and shape to accommodate a row of lock cores; and,

(b) a planar back board of a dimensional size so that it totally overlaps said pocket portion, said back board being hingedly attached at its lower edge to said pocket portion lower lip edge.

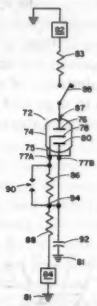
4,326,762
APPARATUS AND METHOD FOR SPOT-KNOCKING TELEVISION PICTURE TUBE ELECTRON GUNS

Richard L. Hockenbrock, Mundelein, and James W. Schwartz, Deerfield, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Continuation of Ser. No. 34,787, Apr. 30, 1979, abandoned. This application Oct. 15, 1980, Ser. No. 197,031

Int. Cl.[3] H01J *9/00*

U.S. Cl. 316—1 13 Claims



1. An apparatus for spot-knocking an electron gun enclosed in the evacuated envelope of a cathode ray picture tube by inducing beneficial arcing between two selected electrodes of said gun, each electrode being connected to an associated electrical conductor extending through said envelope, said picture tube having an inherent capacitance that can store energy in an amount capable of supporting a destructive arc during said spot-knocking said apparatus comprising:

a first high-voltage source connected to one of said electrodes through its associated electrical conductor for supplying a first potential to said electrode, said potential having a value at least long-term average which is many kilovolts positive relative to a predetermined ground;

a second high-voltage source connected to the other of said electrodes through its associated electrical conductor for supplying a second potential to said other electrode, said potential having a value at least long term average which is many kilovolts negative relative to said ground, the difference between said first potential and said second potential being effective to induce said beneficial arcing between said electrodes;

whereby, by the application of the bipolar potential across said electrodes, the amount of energy in the induced arcing, for a given applied potential, is very much less than would be the case if a unipolar potential were applied.

4,326,763
ELECTRICAL PLUG

Ilija Ristovski, Kuppenheim, Fed. Rep. of Germany, assignor to Djoko Ristovski, Kuppenheim, Fed. Rep. of Germany

Filed Jan. 8, 1980, Ser. No. 110,292

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1979, 2900491

Int. Cl.[3] H01R *13/62*

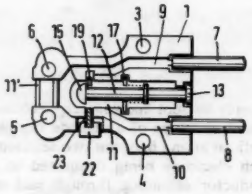
U.S. Cl. 339—14 P 3 Claims

1. In an electrical plug of the type including a housing made

of insulating material for receiving plug contacts and coupling means for a feeder cable, the improvement comprising:

said housing having a front end portion having a front face, a central bore formed therein disposed normally to and opening into said front face thereof, a rigid abutment extending radially into said central bore; a rear end portion having a cable bore for said feeder cable which is disposed in axial alignment with said central bore and a pair of feeder cable conduits formed therein disposed on opposite sides of said central bore, spaced therefrom, which merge with said cable bore in said rear end portion and open onto said front face of said front end portion;

a retractable spring-loaded release device received in said housing for movement between a retracted position, in which it is disposed substantially within said housing, and a withdrawn position, in which is projects outwardly fro said front face, said spring-loaded release device comprising a bolt disposed at least partially within said central bore having a flange which serves as an offset abutment and a rounded abutment disposed at one end thereof, said bolt being positioned in said bore such that said flange thereof is disposed in front of said rigid abutment, and a helical spring received on said bolt which is biased between said rigid abutment of said housing and said flange of said bolt so as to urge said bolt in a direction towards said withdrawn position thereof; and



an actuation device mounted on said housing for triggering movement of said spring-loaded release device to said withdrawn position thereof by spring force, so that when said plug is received within a wall socket or a coupling having a mounting face opposing said front face thereof, said release device upon actuation will engage and push off from said mounting face to automatically effect or at least facilitate plug release, said actuation device being releasably coupled to said rounded abutment of said bolt and including an actuation button which, when depressed, effects release of said rounded abutment of said bolt, so as to permit said bolt to move to said withdrawn position thereof under the force of said spring so as to facilitate plug release, said actuation device also comprising a plate having an opening formed therethough which is mounted for which is mounted for reciprocal movement in said bore for movement between a locking position in which said rounded abutment of said bolt is retained in engagement with said plate opening and a release position in which said rounded abutment is released from said opening, said plate being attached to a lug extending outwardly of said housing on which said button is secured, said button being spring-loaded so as to urge the same outwardly and so as to normally maintain said plate in a locking position, and so that, upon depression of said button, said plate is moved to said release position thereof under spring tension.

4,326,764

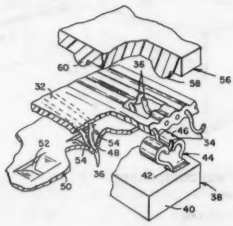
CONNECTOR FOR TERMINATING HIGH DENSITY CABLE

John C. Asick, Harrisburg, and Clifton W. Huffnagle, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 948,836, Oct. 5, 1978, abandoned. This application Feb. 21, 1980, Ser. No. 123,317

Int. Cl.³ H01R *11/20*

U.S. Cl. 339—14 R **6 Claims**



1. An improved means for terminating the conductors of multi-conductor flat flexible cable in which a plurality of conductors are held in spaced parallel relation by insulation with at least the insulation slit adjacent some of the conductors which are then exposed from a flat surface of said cable by pushing a loop of bare conductor out of the insulation, said means comprising:

terminal means having a pair of resilient tine members having opposing major planar surfaces extending in the direction of the conductors and defining smooth surfaces of transition leading to a slot therebetween, each said loop received in a respective slot in force fit to make good mechanical and electrical contact therebetween; and

housing means enclosing said terminal means.

4,326,765

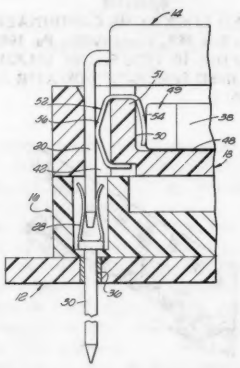
ELECTRONIC DEVICE CARRIER

Salvatore T. Brancaleone, Tempe, Ariz., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 15, 1980, Ser. No. 140,582

Int. Cl.³ H01R *13/66, 23/68*

U.S. Cl. 339—17 CF **11 Claims**



1. An electronic package assembly comprising:

a carrier mounted between a DIP and a DIP adapter, said DIP embodying a row of vertical conductive leads and said DIP adapter containing a row of terminals;

said carrier comprising:

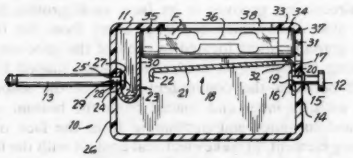
an insulator having a top surface and a bottom surface;
a plurality of contact cavities in said insulator extending from said top surface to said bottom surface, said cavities being arranged in a row corresponding to said row of leads;
a recess in said insulator spaced from said row of cavities defining therebetween an insulation barrier;
contacts associated with selected ones of said cavities;
each said contact having a first spring portion extending into said cavity and a second spring portion extending into said recess, and a bridging portion extending around said barrier;
said vertical conductive leads of said DIP extending downwardly into said cavities engaging said first spring portions of said contacts and downwardly into said DIP adapter engaging said terminals therein; and
a microelectronic device mounted in said recess having conductors engaging said second spring portions of said contacts whereby said DIP leads, DIP adapter terminals and microelectronic device conductors are electrically interconnected.

4,326,766

OPTIONALLY FUSED CONNECTOR DEVICE

Mark T. Basseches, 420 Lexington Ave., New York, N.Y. 10017

Filed Apr. 28, 1980, Ser. No. 144,263
Int. Cl.³ H01R *29/00, 3/00;* **H01H** *85/04, 85/28*
U.S. Cl. 339—31 R **10 Claims**



1. An optionally fused connector device comprising a body portion of insulating material, input terminal means on said body portion for reception of an input lead, output terminal means on said body portion for engagement with a device to be powered, a fuse receiver chamber formed in said body portion and sized to receive a fuse member having first and second contacts, first and second connector leads extending respectively from said input and output terminal means, each said lead including a portion within said chamber positioned to engage one of said contacts of a fuse disposed in said chamber, switch means in said body portion normally connecting said input and output terminal means, and switch control means positioned to engage a fuse inserted into said chamber for opening said switch means responsive to insertion of a fuse into said chamber, thereby to insert said fuse as the sole connective path between said input and output terminal means said switch control means positioned to close said switch means responsive to removal of said fuse from said chamber.

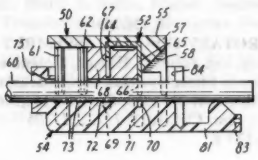
4,326,767

WIRE CUTTING ELECTRICAL CONNECTOR

Raymond A. Silbernagel, Ramsey, and Garry L. Sjolander, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 19,577, Mar. 12, 1979, abandoned. This application Jan. 14, 1980, Ser. No. 107,887
Int. Cl.³ H01R *4/24*
U.S. Cl. 339—98 **17 Claims**

1. A wire connector comprising:
a hollow, open-topped, insulating body having a base wall, a pair of generally parallel side walls extending generally perpendicularly from said base wall and an end wall extending from said base wall between said side walls at one end of said body, the upper edge of at least a portion of said end wall being inclined at an acute angle to said base wall, and the end of said body opposite said end wall being open for access by at least one wire,
a U-shaped, resilient, conductive wire connector element, the legs of the U being wide and thin, one of the legs being formed with at least one wire connecting slot extending from the top of said leg toward the base of said U, the second leg being sharpened along its top edge in alignment with at least one said wire connecting slot in said first leg, said connector element being positioned in said body with the base of the U on said base wall of said body and said second leg abutting and extending above said inclined portion of said body end wall, and



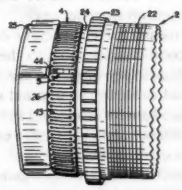
an insulating cover formed to telescope with said body, said cover having means to carry a wire into each said connector element slot and to cooperate with said sharpened second leg of said connector element to sever at least one wire extending through said connector upon telescoping of said cover and said body fully together,
said body and cover being formed with means to seal the end of said connector adjacent said sharpened second leg of said connector element when said body and cover are fully telescoped together, and complementary latch members to retain said body and cover in an open position to permit at least one wire to be inserted into said body end that is open for access by at least one wire and through said connector between said body and cover, and to retain said body and cover in a crimped position with said cover and body fully telescoped together.

4,326,768

ELECTRICAL CONNECTOR GROUNDING STRAP CONNECTION

Stephen Punako, Bainbridge, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 2, 1980, Ser. No. 155,717
Int. Cl.³ H01R *4/66*
U.S. Cl. 339—143 R **2 Claims**



1. In combination with an electrical connector of the type having a first connector shell; a second connector shell; means for coupling said first shell to said second shell; a grounding strap wrapped around a portion of one of said shells to suppress electromagnetic radiation entering the connector, said grounding strap comprising: a flat elongated piece of electrically conducting material; a first plurality of holes arranged along a common axis along one of the elongated sides of the material; a second plurality of holes arranged along a common axis

along the other elongated side of the material; and a plurality of slits in said material, each of said slits extending from one of said holes to the edge of the elongated side furthest from said hole to define a plurality of interconnected legs; and means for securing said strap to one of said shells, the improvement wherein said securing means comprises;

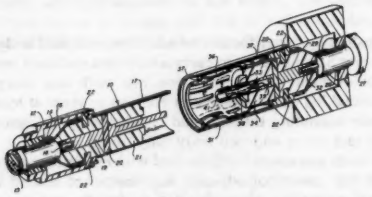
a sleeve for securing opposite ends of said grounding strap together, said sleeve having the last leg at each end of the grounding strap extending into said sleeve, thereby securing the strap to said one shell.

4,326,769

ROTARY COAXIAL ASSEMBLY

Glenn F. Dorsey, and James C. Hassall, II, both of Blacksburg, Va., assignors to Litton Systems, Inc., Blacksburg, Va.

Filed Apr. 21, 1980, Ser. No. 142,246
Int. Cl.³ H01R *11/22, 17/06*
U.S. Cl. 339—177 E **1 Claim**



1. In a miniature rotary coaxial assembly for electrically coupling two coaxial leads one to the other, a combination comprising:

a stator cover and a rotary housing,

an external pin and a smaller diameter internal pin rigidly fixed to the stator cover,

stator insulation means for electrically insulating the external pin from the internal pin and for maintaining a coaxial relationship therebetween,

stator adaptor means for electrically coupling the external lead of a first coaxial cable to the external pin and means for electrically coupling the internal lead of said first coaxial cable of the internal pin,

an external socket and a smaller internal socket rigidly fixed to the rotary housing,

rotor insulation means for electrically insulating the external socket from the internal socket and for maintaining a coaxial relationship therebetween,

rotor adaptor means for electrically coupling the external lead of a second coaxial cable to the external socket and means for electrically coupling the internal lead of said second coaxial cable to the internal socket,

a first conductive band of elongated louvered contacts lining the external socket and electrically coupling said external socket to the external lead,

a second conductive band of elongated louvered contacts lining the internal socket and electrically coupling said internal socket to the internal pin,

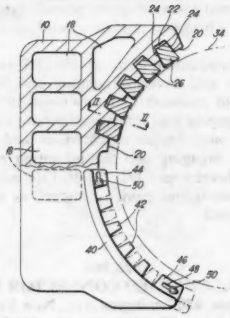
wherein the fit between the first conductive band and the external pin and between the second conductive band and the internal pin allows relative rotational motion therebetween and provides a low noise sliding electrical contact, whereby the rotary housing in the second coaxial cable and the external and internal sockets rotate freely as a unit with respect to the stator cover, the first coaxial cable, and the external and internal pins.

4,326,770

ELECTRODE CLAMP

Colin F. Widmer, Middlesbrough, England, assignor to James Brown & Sons, Ltd., Great Britain

Continuation of Ser. No. 37,294, May 9, 1979, abandoned. This application Nov. 24, 1980, Ser. No. 210,139
Int. Cl.³ H01R *13/22*
U.S. Cl. 339—278 C **11 Claims**



1. A contact assembly capable of passing large electric currents comprising a pair of conducting elements disposed face to face, at least one of said conducting elements having a plurality of insert-receiving grooves in its face, each groove having opposed side walls which converge away from the face, a separate graphite insert located in each of the grooves, each insert being formed of an independent body shaped to normally fit between the convergent walls of the associated groove, with its inner end spaced from the bottom of the groove and its outer end protruding from the face of said conducting element, to make electrical contact with the face of the other one of the conducting elements, and means for pressing the two conducting elements towards each other sufficient to push the most protruding ones of said inserts into their associate grooves until substantially all of said inserts are in contact with the other one of said conducting elements, giving good electrical contact between the graphite inserts and the two conducting elements and thereby a path for the electrical current from one conducting element to the other through the graphite inserts.

4,326,771

METHOD OF COUPLING BETWEEN AN OPTICAL FIBER AND AN OPTOELECTRONIC DIODE, AND A TRANSMITTING OR RECEIVING HEAD FABRICATED BY MEANS OF SAID METHOD

Raymond Henry; Jean-Victor Bouvet; Alain Chapard, and Jacques Simon, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 2, 1980, Ser. No. 193,294
Claims priority, application France, Oct. 5, 1979, 79 24891
Int. Cl.³ G02B *5/14;* **H01L** *31/18*
U.S. Cl. 350—96.17 **10 Claims**

1. A method of coupling between an optical fiber and an optoelectronic diode, wherein said method comprises the following steps:

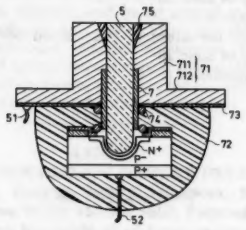
(a) fabrication of a semiconductor structure which is capable of constituting an optoelectronic diode by addition of a doped semiconducting layer so as to constitute with the rest of the structure a rectifying junction;

(b) formation of a cavity by chemical etching of the structure on a plane face which is intended to be coupled to the optical fiber and to provide a seating for the rectifying junction, the chemical etch being localized in a zone which is delimited by a layer of etch-resistant material;

(c) formation of the rectifying junction by doping of the

semiconductor material constituting the internal wall of the cavity;

(d) fabrication of an optoelectronic head by fitting the end of an optical fiber within the cavity of the structure.



7. An optoelectronic head obtained by means of a method according to claim 1, wherein electrical connecting leads are connected to contacts formed on semiconducting zones of opposite conductivity types forming part of the diode.

4,326,772

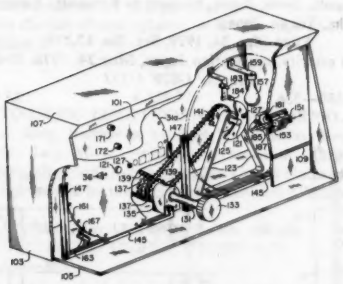
STEREOSCOPIC PICTURE SYSTEM

George F. Hausherr, 16 Norwich Ave., Lynbrook, N.Y. 11563

Filed Jan. 30, 1980, Ser. No. 116,900

Int. Cl.³ G02B *27/22*; G03B *21/00, 35/18*

U.S. Cl. 350—134 **26 Claims**



1. A stereoscopic viewing system useful especially in sales promotion and in instruction, comprising two separate carrier means which are substantially duplicates of each other, each having thereon a multiplicity of pairs of stereoscopically related images, cabinet means enclosing said carrier means, two separate binocular viewing means mounted on said cabinet means and arranged so that one person placing his eyes at one of said viewing means may observe a pair of stereoscopically related images on one of said carrier means while another person placing his eyes at the other of said viewing means may simultaneously observe a duplicate pair of stereoscopically related images on the other of said carrier means, each of said separate carrier means comprising a relatively easily removable and replaceable image-bearing unit in the form of an approximately circular disk having substantially radial rows of images, each radial row containing, on a single radial line from the center of the disk to an outer edge thereof, not less than two pairs of stereoscopically related images with one image of each pair located between two images of another pair on the same radial row, the binocular viewing means being mounted on an upright wall of said cabinet means, and said cabinet means being shaped to provide knee space beneath said upright wall, so that two persons such as, for example, an instructor and a pupil, or a salesman and a customer, or two customers, may be seated side by side in front of and facing said cabinet means and while thus seated may observe the stereoscopic images on the respective image-bearing units through the respective binocular viewing means, manually controlled means for simultaneously turning both of said disks to bring a fresh radial line of images thereon into alignment with said binocular viewing means, and manually controlled means for causing a simultaneous relative shift of the relative positions of the binocular viewing means and their respective disks in a direction radially of the disks to cause different pairs of stereoscopic images on the same radial lines to be simultaneously brought into view of the two observers using the two binocular viewing means.

4,326,773

SOLAR ENERGY FOCUSING MEANS COMPRISING MODULAR ELEMENTS

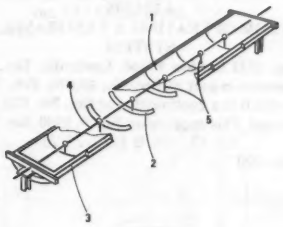
Francois Colas, Bourg la Reine, France, assignor to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

Filed Apr. 4, 1980, Ser. No. 137,364

Claims priority, application France, Apr. 11, 1979, 79 09961

Int. Cl.³ G02B *5/10, 7/18*; B21D *39/04*

U.S. Cl. 350—292 **3 Claims**



1. A solar energy focusing means comprising modular cylindro-parabolic reflector elements in the form of thick panels filled with plastics foam comprising means for assembly of one reflector element in alignment with adjacent reflector elements characterized in that said assembly means in each reflector element comprises at least two thin metal tubes (7 and 7') of the same diameter, which are disposed in the thickness of the plastics foam parallel to the generating lines of the cylinder, and end (8 and 8') of each tube projecting beyond the section plane of the reflecting surface and being constricted for receipt in telescoping relation within the unconstructed ends of the homologous tube of the adjacent element, each tube being disposed in a strictly defined position with respect to the reflecting surface (1) whereby the homologous tubes (7 and 7') of adjacent reflector elements are disposed strictly in endwise alignment with each other.

4,326,774

SNAP-ON CONVEX REAR VIEW MIRROR FOR BICYCLES

William Beigl, 2521 W. Montrose, Chicago, Ill. 60618

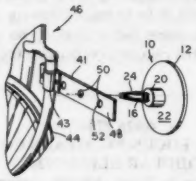
Filed Oct. 29, 1980, Ser. No. 202,365

Int. Cl.³ G02B *5/10*

U.S. Cl. 350—307 **2 Claims**

1. A convex rear view mirror for removable attachment to a support bracket therefor mounted on a bicycle which comprises a convex mirror portion, a mirror positioning portion for adjusting said mirror, and a tapered open shaft portion, said bracket further comprising an elongated bar having at least one opening therein, said tapered open shaft being insertable into said opening and said tapered open shaft having snap-on means for removably engaging said elongated bar of said support bracket, wherein said mirror positioning portion further comprises a post, a ball on one end of said post, and a universal joint

bearing, said ball being engaged in said universal joint bearing, said mirror positioning portion being joined to said mirror, said shaft fitting over said post and further comprising a pair of spaced opposing upper and lower walls and a pair of spaced opposing based ends, said shaft closed at one based end and



open at the other based end, said walls tapering outwardly towards said ball then curving inwardly towards said post mergingly forming upper and lower slots with terminal arc-shaped portions at the other based open end of said opposing walls, said slots forming the snap-on means for removably engaging said opening in said elongated bar.

4,326,775

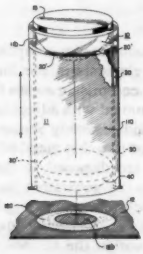
METHOD FOR OPERATING A PANORAMIC OPTICAL SYSTEM

Don G. King, 1031 Shadow Wood, Lewisville, Tex. 75067

Continuation-in-part of Ser. No. 10,076, Feb. 7, 1979, abandoned, which is a continuation of Ser. No. 822,402, Aug. 8, 1977, abandoned. This application Jun. 9, 1980, Ser. No. 157,865

Int. Cl.³ G02B *5/10, 27/18*

U.S. Cl. 350—320 **1 Claim**



1. A method for operating a panoramic optical system of the type for recording images disposed substantially 360° around the system onto a film plane, said method comprising the steps:

(a) spacing the top of a curved lens from said film plane at a distance i, said lens having a base portion and a curved outer surface of light reflective material of diameter b and radius of curvature r between its top and base, said curved surface being symmetrical about an axis which extends transversely to the film plane, and an origin of curvature p located at a distance x with respect to said axis and at a distance y with respect to the top of said lens, the axis of said curved surface being substantially perpendicular to said film plane;

(b) enclosing the space between the base of said curved lens and said film plane with a sleeve, said sleeve having a transparent zone for enabling light rays from the outside of said sleeve to impinge upon the outer surface of said curved lens and an opaque zone contiguous with the transparent zone for preventing said light rays from impinging upon a predetermined area at the base portion of said lens; and,

(c) positioning the border defined by the transparent/opaque zones of said sleeve at a distance h below the top of said lens wherein

$h = r \sin(\alpha) - y$

where

r=the radius of curvature of the curved surface **13** at the boundary of zone **20**

$r_b = r \cos(\alpha) - x$

p=origin or curvature of the curved surface **13** at the boundary of zone **20**

x, y=coordinates of p

$$x = \frac{r_b y}{h}$$

$$y = \left(x + \frac{b}{2}\right) \tan \beta$$

α=arc tan y/x

$$\beta = \text{tilt angle} = \arctan\left(\frac{y}{x + \frac{b}{2}}\right)$$

b=diameter of reflector lens top surface

i=vertical distance from top of reflector lens to film plane **12**.

4,326,776

MATRIX ELECTRODE CONSTRUCTION

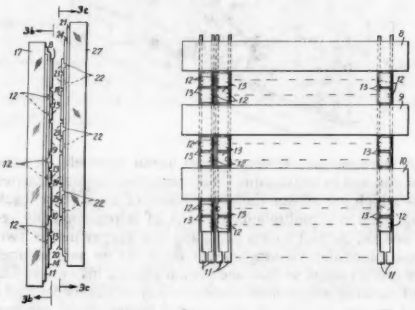
Shunji Banda, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 24, 1979, Ser. No. 42,278

Claims priority, application Japan, May 24, 1978, 53-61986

Int. Cl.³ G02F *1/133*

U.S. Cl. 350—336 **15 Claims**



1. A matrix display comprising:

a plurality of elemental cell electrodes defining an excitation region in a liquid crystal layer, said cell electrodes being arranged to form a matrix of rows and columns;

a plurality of narrow and elongated data electrodes for connecting together a given number of nonadjacent elemental cell electrodes in each row of cell electrodes;

an insulating layer between said cell electrodes and said data electrodes;

a plurality of openings through said insulating layer, each said opening exclusively associated with one cell electrode and exposing a portion of one data electrode to said one associated cell electrode, a connection being formed between said one data electrode said one associated cell electrode through said opening;

a plurality of scanning electrodes, each said scanning elec-

trode opposing a portion of said elemental cell electrodes and spaced apart therefrom, each scanning electrode being located on the same surface of an insulating layer as approximately half of the cell electrodes and alternating with pairs of cell electrodes, the scanning electrodes forming column excitation electrodes;

a liquid crystal material, said liquid crystal material being positioned between said spaced apart cell electrodes and scanning electrodes, selective application of voltage of suitable level across said opposed scanning electrodes and elemental cell electrodes actuating the excitation region of said liquid crystal therebetween for display.

4,326,777

ELECTROCHROMIC DISPLAY DEVICE

Rikusei Kohara, Ibaraki; Susumu Kakumoto, Nagaokakyo; Takashi Aoyama, Ikeda; Masami Shoji, Takatsuki, and Mutsuaki Shinagawa, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 21, 1979, Ser. No. 96,478

Claims priority, application Japan, Nov. 25, 1978, 53-145458

Int. Cl.³ G02F *1/17, 1/23*

U.S. Cl. 350—357 **9 Claims**

1. An electrochromic display device comprising:

a cell container having at least one transparent wall,

a display electrode and a counter electrode of a chemically stable electrical conductor, and disposed in said container,

an electrochromic aqueous solution comprising:

N,N'-di(p-cyanophenyl)-4,4'-bipyridinium dichloride,

phosphoric acid in an amount to provide a pH for said solution, and

ammonium ferrous sulfate as a source of ferrous ions present in said solution in an amount of from about 0.001 to about 0.5 mol per liter,

wherein the pH of said solution is in the range of about 0.8 to about 3.

4,326,778

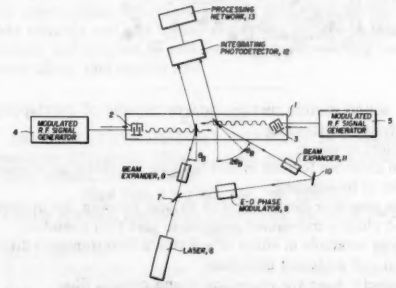
ACOUSTO-OPTIC TIME INTEGRATING CORRELATOR

Norman J. Berg, Baltimore; Michael W. Casseday, Greenbelt; John N. Lee, Silver Spring, and Irwin J. Abramovitz, Baltimore, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 12, 1980, Ser. No. 148,653

Int. Cl.³ H03H *9/25;* **G02F** *1/33*

U.S. Cl. 350—358 **8 Claims**



1. A surface wave acousto-optic time integrating correlator apparatus for correlating first and second electrical signals, comprising:

an acousto-optic interaction medium,

first and second acoustic transducer means disposed on the surface of said acousto-optic interaction medium,

means for applying a first high frequency A.C. signal to said first acoustic transducer means for causing a first acoustic wave to propagate along the surface of said medium, the envelope of said first A.C. signal corresponding to said first electrical signal,

means for applying a second high frequency A.C. signal to said second acoustic transducer means for causing a second acoustic wave to propagate along the surface of said medium, the envelope of said second A.C. signal corresponding to said second electrical signal.

means for directing a first laser light beam across said medium for interacting primarily with said first propagating acoustic wave,

means for directing a second laser light beam across said medium for interacting primarily with said second propagating acoustic wave,

a time integrating photodetector means, and

means for directing both said first and second beams at said photodetector means after they have traversed said acousto-optic interaction medium.

4,326,779

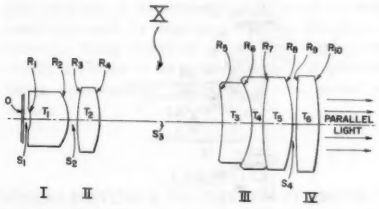
10× MICROSCOPE OBJECTIVE

Edward B. Rybicki, Depew, and Milton H. Sussman, Amherst, both of N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 28, 1980, Ser. No. 144,745

Int. Cl.³ G02B *21/02, 9/34*

U.S. Cl. 350—414 **3 Claims**



1. A four component, semi-apochromatic, low power microscope objective having an NA of about 0.3 which comprises, aligned on an optical axis, a concavo-convex negative singlet I, a biconvex positive singlet II, a concavo-convex negative triplet III consisting of a concavo convex first element having an Abbe number of at least 95, a biconcavo second element and a biconvex third element having the same dispersion value as the first element of the triplet and a biconvex positive singlet IV.

4,326,780

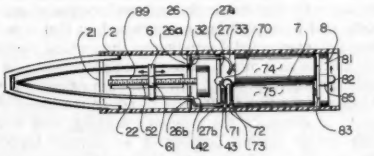
PORTABLE THERMO-ANEMOMETER WITH BIMETALLIC SENSOR

Dae Sik Kim, 1178 Walnut St., Newton, Mass. 02161

Filed Jan. 25, 1980, Ser. No. 115,545

Int. Cl.³ G01K *5/00;* **G08B** *17/06*

U.S. Cl. 340—594 **6 Claims**



1. A hand held probe for detecting ambient air temperature changes comprising:

a. plurality of cantilever bimetallic temperature sensing

strips having fixed ends spacedly mounted by means in one end of said probe, said sensing strips extending outwardly from said one end of said probe with free ends of said sensing strips arranged to contact at a substantially (fixed) remote location by thermally induced bending toward each other;

b. movable means operatively cooperating with said spacedly mounted means and said sensing strips for controllably separating said free ends from each other by partially nullifying said thermally induced bending by selective movement of movable means to separate said free ends;

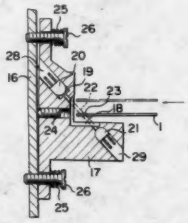
c. means co-acting with said movable means to selectively move said free ends, wherein indicia on said support will indicate the extent of said separation required to balance against said bending;

d. means connected to said sensing strips to visually indicate when said free ends come into contact with each other.

4,326,781
FILM SAG DETECTING DEVICE FOR SOUND CINECAMERA

Wataru Ogura, Suwa, Japan, assignor to Chinon Industries Incorporation, Suwa, Japan

Filed Mar. 23, 1978, Ser. No. 889,264
Claims priority, application Japan, Apr. 8, 1977, 52/44516[U]
Int. Cl.³ G03B *31/00*
U.S. Cl. 352—14 **2 Claims**

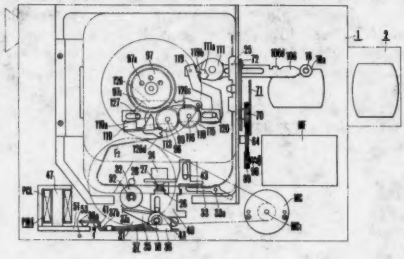


1. In a sound cinecamera comprising a sound cinecamera body defining a compartment for holding a film cartridge containing a movable film, said sound cinecamera body having an openable front portion so that the film cartridge can be loaded therein, intermittent film-feeding means for intermittently advancing said film for effecting exposure thereof and continuous film-feeding means for continuously advancing said film past sound recording means to record sound thereon, the sound cinecamera body providing an open film path between said intermittent film-feeding means and said continuous film-feeding means including a portion of said open film path wherein the film sags to a variable extent depending on the speeds of movement imparted to said film by said intermittent film-feeding means and said continuous film-feeding means, the improvement which comprises: a film sag detecting device comprising an opto-electronic coupler located adjacent said open film path and adjacent the back portion of the sound cinecamera body so as not to interfere with loading and unloading of a film cartridge into said body, said opto-electronic coupler defining a light path which is inclined relative to the film surface as the film moves through said portion of said open film path, said light path being positioned so that it is interrupted or not interrupted depending on the vertical position of said film surface as it moves through said portion of said open film path and interruption of said light path caused by excessive sagging of the film is effective to adjust the speed of film movement to eliminate the excessive sagging, said film sag detecting device further comprising an upright supporting member mounted on the back of said sound cinecamera body and a substantially L-shaped frame, said frame comprising a substantially horizontal leg and a substantially vertical leg, said vertical leg extending upwardly alongside said supporting member and being mounted thereon, said horizontal leg projecting from the lower end of said vertical leg toward the front portion of said sound cinecamera body and being disposed below said open film path, said opto-electronic coupler comprising a light emitting element and a light receiving element mounted on said frame with their optical axes in longitudinal alignment with each other to define said light path, one of said light emitting element and said light receiving element being mounted in said vertical leg and the other of said light emitting element and said light receiving element being mounted in said horizontal leg, the light path defined by the aligned optical axes of said light emitting element and said light receiving element extending outside the frame diagonally between said vertical leg and said horizontal leg substantially in the form of a hypotenuse of the right angle defined by the intersection of said vertical leg and said horizontal leg, whereby when the film is in the normal state free of excessive sag it is disposed above said light path and when the film sags excessively its edge intersects said light path, said light emitting element and said light receiving element being mounted in openings in said vertical and horizontal legs of said frame, said legs having aligned passageways extending from the inner ends of said openings toward each other, and a transparent L-shaped plate covering the internal corner of said L-shaped frame and covering the inner opposing ends of said passageways, whereby loading and unloading of the film cartridge can be effected easily and film sag is accurately detected by said opto-electronic coupler.

4,326,782
SOUND MOTION PICTURE CAMERA CAPABLE OF OVERLAPPING EXPOSURES

Hidekazu Okajima, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 4, 1979, Ser. No. 72,322
Claims priority, application Japan, Sep. 8, 1978, 53-111072
Int. Cl.³ G03B *21/36*
U.S. Cl. 352—91 C **1 Claim**



1. A sound motion picture camera capable of overlapping film exposures including:

a camera housing;

a film chamber formed in said housing for receiving a sound film to be exposed;

a film chamber cover secured to said housing for opening and closing movement relative to said film chamber;

a motor rotatable in either of a forward film transport direction and a rewind direction;

a magnetic head for recording sound on said film;

a head pad and a movable member for supporting said head pad;

a spring for urging said head pad in a direction to abut against said magnetic head;

an operating member mounted on said camera housing to be manually operated;

a first displacement member for moving said movable member in response to operation of said operating member between a first position whereat said head pad is pressed

against said magnetic head and a second position whereat said head pad is spaced apart from said magnetic head;

actuating means for controlling an overlap film exposure operation;

means responsive to said actuating means for rotating said motor in the film rewind direction;

a second displacement member mounted for movement in response to rotation of said motor in the film rewind direction; and

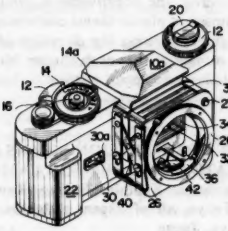
means for moving said head pad away from said magnetic head in response to movement of said second displacement member irrespective of the movement of said first displacement member.

4,326,783

INTERCHANGEABLE OBJECTIVE LENS SINGLE-LENS REFLEX CAMERA FOCUSING DEVICE

Kunio Kawamura, Sakai, and Hiroshi Ueda, Nara, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 24, 1981, Ser. No. 247,189
Claims priority, application Japan, Mar. 26, 1980, 55-39325
Int. Cl.³ G03B *3/10, 7/08*
U.S. Cl. 354—25 **20 Claims**



1. A single lens reflex camera including a body member and housed in the upper part of said body member, a pentaprism having a downwardly facing bottom face, comprising a lens mount disposed forwardly of said body member, an objective lens separably coupled to said lens mount coaxially with the optical axis of said body member, a pair of laterally spaced extendable contractable extension members extending between said lens mount and body member and supporting said lens mount for longitudinal linear advance and retraction along said optical axis at a fixed orientation of said lens mount, an extendable contractable light tight conduit extending between said body member and lens mount and means located in said body member and coupled to said lens mount for shifting said lens mount along said optical axis.

4,326,784

INFORMATION DISPLAY DEVICE FOR CAMERA

Toshikazu Ichiyanagi, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1980, Ser. No. 120,920
Claims priority, application Japan, Feb. 16, 1979, 54-16956
Int. Cl.³ G03B *17/20*
U.S. Cl. 354—53 **20 Claims**

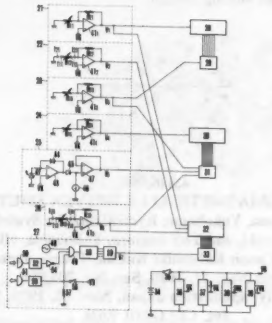
6. An information display device for a camera, comprising:

first signal producing means for producing information signals corresponding to a given one of a plurality of information values;

first display means having a plurality of display elements corresponding to one of the information values for given ones of the display elements corresponding to the given one of the information values which corresponds to the information signals from said first signal producing means;

second display means having a plurality of display elements corresponding to the plurality of display elements of the first display means for placing a given number of display elements of said plurality of display elements of the second display means consecutively in a display state corresponding to an allowance range signal;

second signal producing means for producing an allowance range signal corresponding to an allowance range of the certain information value and for applying the allowance range signal to said second display means; and



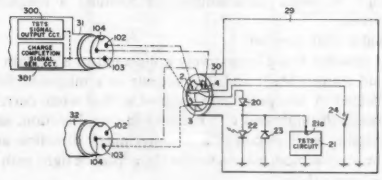
correspondence means to have the plurality of display elements of the first display means and the plurality of display elements of the second display means correspond to each other and for displaying whether the given display elements being displayed in the first display means is within the range of the given number of display elements being consecutively displayed in the second display means.

4,326,785

CAMERA HAVING A CONNECTOR COMMON TO A FLASH BULB UNIT AND AN ELECTRONIC FLASH UNIT

Masaaki Tsukamoto, Tokyo; Yuji Ohkubo, Ohmiya, and Naoki Tomino, Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 18, 1981, Ser. No. 235,682
Claims priority, application Japan, Feb. 29, 1980, 55-24908[U]
Int. Cl.³ G03B *7/00, 15/05, 17/08*
U.S. Cl. 354—60 F **4 Claims**



1. A camera provided with first connecting means capable of being selectively coupled to second connecting means of a flash bulb unit and third connecting means of an electronic flash unit, and having a first terminal connected in common to a synchronizing terminal in said second connecting means and a tuning shutter time setting signal terminal in said third connecting means, a second terminal connected to a synchronizing terminal in said third connecting means, and a third terminal connected in common to ground terminals in said second and third connecting means, said camera including:

a tuning shutter time setting circuit having its input terminals connected to said first terminal, said circuit being adapted automatically to set the shutter time to an electronic flash

unit tuning shutter time by receiving a tuning shutter time setting signal as input; and

a protective circuit for said tuning shutter time setting circuit, said protective circuit being adapted to detect, from a voltage applied between said first terminal and said third terminal, that said second connecting means has been connected and, as the result of said detection, to prevent the voltage of said first terminal from being applied as input to said setting circuit.

4,326,786

ELECTROMAGNETICALLY DRIVEN SHUTTER

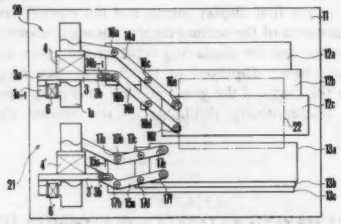
Takashi Uchiyama, Yokohama; Ryoichi Suzuki; Syuichiro Saito, both of Kawasaki, and Yoji Sugiura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1980, Ser. No. 206,990

Claims priority, application Japan, Nov. 16, 1979, 54-148663

Int. Cl.[3] G03B *9/08*

U.S. Cl. 354—234 **28 Claims**



1. An electromagnetically driven shutter comprising:

at least one shutter blade;

said blade being able to open and close an exposure light path;

a permanent magnet;

said magnet being fixedly mounted relative to the light path in the interior of a camera, and having a yoke of high magnetic permeability for forming a magnetic circuit;

a movable coil member;

said member being operatively connected to a portion of said shutter blade and displaceable in a magnetic field formed by said permanent magnet so that when current passes through said coil member in one direction, said member is displaced in a predetermined direction and the shutter blade passes across the exposure light path in response thereto;

a movable magnetic member

of a material of high magnetic permeability connected to said movable coil member, and movable in response to the displacement of the coil member, said movable magnetic member being holdable by attraction to a portion of the yoke of the permanent magnet at the terminal end of the displacement path of the movable coil member;

electromagnetic release means;

on at least one of the movable magnetic member and the yoke of the permanent magnet arranged upon current supply thereto to be magnetized in a direction to shut off the magnetic circuit formed between said permanent magnet and the movable magnetic member.

4,326,787

MAGNETIZED SHUTTER BLADES

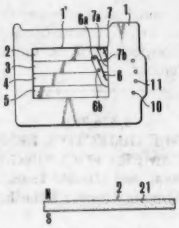
Michio Senuma, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1981, Ser. No. 254,767

Claims priority, application Japan, Apr. 18, 1980, 55-51416

Int. Cl.[3] G03B *9/40*

U.S. Cl. 354—246 **2 Claims**



1. In a camera shutter having a plurality of shutter blades which partially overlap each other when an exposure opening in said camera is covered, the improvement comprising that said shutter blades consist of plastic sheets containing magnetic powder and are magnetized along the direction of the thickness thereof in such a manner that each shutter blade attracts the adjacent blade at the overlapped portion.

4,326,788

INFORMATION TRANSMISSION MEANS IN AN INTERMEDIATE LENS TUBE FOR CAMERA

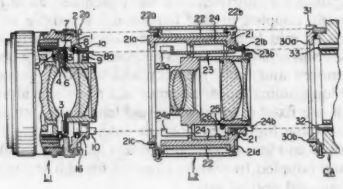
Sachio Ohmori, Yokohama; Kunihiro Fukino, Kawasaki, and Sunao Ishizaka, Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 21, 1981, Ser. No. 256,135

Claims priority, application Japan, Apr. 23, 1980, 55/53951

Int. Cl.[3] G03B *17/14*

U.S. Cl. 354—286 **6 Claims**



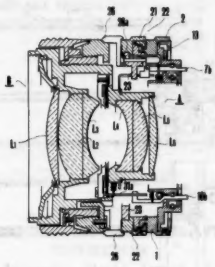
1. In an intermediate lens tube mountable between an interchangeable lens having on the mount thereof means for generating a signal of minimum F-number and a camera having means for detecting said signal on the mount thereof on which said interchangeable lens is mountable and including a circuit for receiving said detected signal and an output derived from the light passed through said interchangeable lens and effecting an exposure operation and which causes vignetting during connection with said interchangeable lens having a minimum F-number smaller than a certain critical minimum F-number, the improvement comprising:

transmission means capable of being couplied to each of said signal generating means and to said detection means during said mounting, said transmission means including correction means for transmitting to said detection means a signal corresponding to said critical minimum F-number only when said minimum F-number signal issued from said signal generating means is smaller than said critical minimum F-number.

4,326,789
INTERCHANGEABLE LENS ASSEMBLY FOR A CAMERA

Masao Aoyagi, Yokohama, and Shigeru Kamata, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1981, Ser. No. 236,016
Claims priority, application Japan, Feb. 27, 1980, 55-23695
Int. Cl.³ G02B *7/02*; G03B *17/00*, *9/02*
U.S. Cl. 354—286 **6 Claims**



1. An interchangeable lens assembly for a camera comprising:

(a) first lens barrel means including

(a-1) first component means and first coupling means adapted to engage complementary coupling means on said camera for mounting said first lens barrel means on said camera,

(a-2) second component means mounted with said first component means and arranged to be rotatable relative thereto, said first and second component means being held in predetermined position relative to each other when said first lens barrel means is detached from said camera,

(a-3) signal transmission means including a signal transmission member for transmission of exposure control signals between said interchangeable lens assembly and said camera, and

(a-4) retainer means adapted to cooperate with complementary retainer means on said camera to maintain said first component means rotatably fixed relative thereto during mounting of said lens barrel means on said camera;

(b) second lens barrel means including

(b-1) third component means and second coupling means adapted to engage complementary coupling means on said first lens barrel means for mounting said second lens barrel means on said first lens barrel means,

(b-2) means for controlling the quantity of light entering said camera through said lens assembly,

(b-3) exposure value setting means rotatably mounted on said second lens barrel means, and

(b-4) connecting means for connecting said signal transmission means and said exposure value setting means.

4,326,790
PHOTOGRAPHIC CAMERA

Noritsugu Hirata, Yokohama; Masamichi Toyama, Machida; Hidekazu Okajima, Naka, and Akimasa Nishimura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

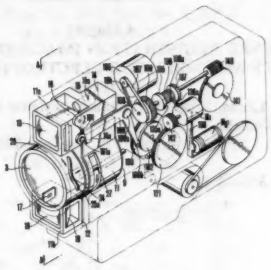
Filed May 23, 1980, Ser. No. 152,543
Claims priority, application Japan, May 29, 1979, 54-67160
Int. Cl.³ G03B *17/02*
U.S. Cl. 354—288 **4 Claims**

1. A camera comprising:

(a) a photograph taking optical system for guiding light coming from an object to be photographed to a predetermined focal plane;

(b) a distance measuring optical system for optically measuring a distance to the object, said distance measuring system being arranged to perform measurements using an optical path which differs from that of said photograph taking optical system, said two optical systems being in a predetermined positional relation to each other;

(c) an optical member carrying body molded into a unitary



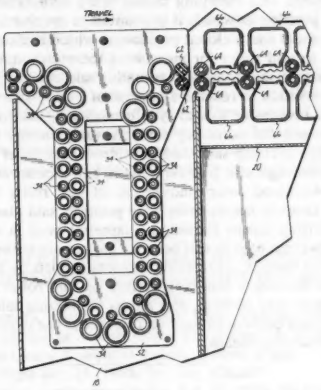
structure for carrying said distance measuring optical system, and

(d) a plate-shaped rigid construction molded inside of said optical member carrying body for guiding at least a part of said photograph taking optical system to keep said optical system in said predetermined positional relation to each other.

4,326,791
TRANSPORT SYSTEM FOR PROCESSOR OF PHOTOSENSITIVE WEB MATERIAL

Robert E. Beer, and Conrad V. Anderson, both of Minneapolis, Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Dec. 12, 1980, Ser. No. 215,690
Int. Cl.³ G03D *3/13*
U.S. Cl. 354—321 **21 Claims**



1. A processor of webs of photosensitive materials comprising:

a plurality of tanks for containing photoprocessing solutions, each tank having an entrance and an exit;

a plurality of opposed pairs of oppositely oriented driven spaced tapered rollers for transporting the web, without engaging the web across its entire width, from the entrance of a first tank of the plurality of tanks through the tanks to the exit of a last tank of the plurality of tanks;

an opposed driven pacer roller pair of cylindrical rollers defining a nip for engaging the web across its entire width

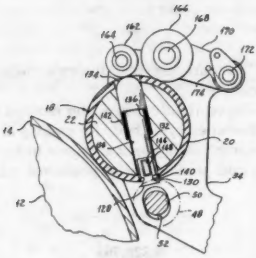
and driving the web, the pacer roller pair being positioned at the exit from the last tank of the plurality of tanks, and being driven at a tangential velocity which is approximately equal to tangential velocity at centers of the tapered rollers, wherein from the entrance of the first tank to the exit of the last tank the web is engaged across its entire width only by the pacer roller pair.

4,326,792

COMBINED REGISTRATION IMAGE TRANSFER AND PICKOFF ASSEMBLY FOR ELECTROPHOTOGRAPHIC COPIER

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Filed Dec. 28, 1979, Ser. No. 107,822
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 TR **12 Claims**



3. In a copier having a moving imaging surface from which a developed image is transferred to a copy sheet fed to said surface at a transfer station and having means for producing a synchronizing signal, apparatus including a roller, means mounting said roller in cooperative relationship with said imaging surface at said transfer station, clamping means, means mounting said clamping means on said roller for movement therewith, said clamping means being actuatable between an open position at which it is adapted to receive a portion of a copy sheet and a closed position at which it clamps said copy sheet to said roller for movement therewith, means normally positioning said roller and actuating said clamping means to its open position to receive a portion of a copy sheet fed thereto, means responsive to said synchronizing signal for driving said roller and for actuating said clamping means to its closed position to clamp said sheet portion to said roller to carry said sheet through said transfer station, and means responsive to a predetermined rotary movement of said roller for restoring said clamping means to its open position, said clamping means comprising means forming a diametral bore in said roller, a member mounted in said bore for movement in the direction of the axis thereof, a clamping element carried by said member, means forming a clamping surface on said roller for cooperation with said element, and means for biasing said member to move said element toward said surface in the closed position of said clamping means.

4,326,793

FULL CANTILEVER STRUCTURAL SUPPORT APPARATUS FOR ROTATABLE ELECTROPHOTOGRAPHIC DRUM

William F. Buboltz, Longwood, Fla., assignor to Burroughs Corporation, Orlando, Fla.

Filed Mar. 24, 1980, Ser. No. 133,577
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 DR **10 Claims**

1. Mounting apparatus for rotatable drum-like structures permitting rapid, efficient dismounting thereof without detailed parts removal comprising,

a rigid, elongated, supporting shaft,

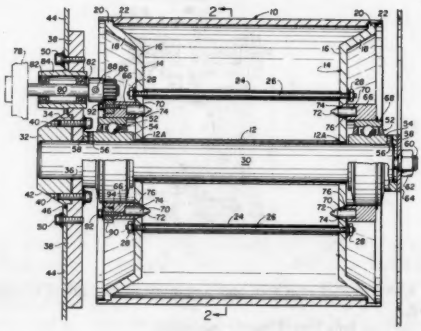
means mounting said shaft against rotation with one end thereof rigidly secured and the opposite end thereof projecting freely away therefrom,

a rotatable member,

means mounting said rotatable member for non-contacting movement about said shaft,

orienting means on said rotatable member,

orienting means on said mounting means matingly engage-



able with said orienting means on said rotatable member for positioning said rotatable member parallel to said shaft,

drive means engaging said rotatable member for effecting rotation thereof, and

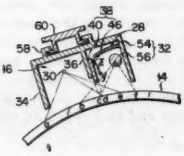
means operably engaging said shaft and said mounting means permitting said rotatable member to be mounted on and dismounted from said shaft without requiring precise fit and adjustment of said rotatable member relative to said shaft while maintaining parallelism between said shaft and said rotatable member.

4,326,794

ELECTROSTATIC COPYING APPARATUS

Fuminobu Nishimura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 29, 1980, Ser. No. 202,172
Claims priority, application Japan, Oct. 31, 1979, 54/139765
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **2 Claims**



1. An electrostatic copying apparatus comprising:

a rotatable drum having an outer photosensitive layer made of a photoconductive material;

corona discharge means for generating a corona discharge to form an electrified corona discharge region on the photosensitive layer;

light-emitting means which is disposed adjacent to the corona discharge means and emits light beams over the electrified corona discharge region of the photosensitive layer, for producing a conductive light-irradiated region overlapping the corona discharge region on the photosensitive layer; and

adjustment means for controlling the dimensions of the

light-irradiated region to control the overlapping portions of the light-irradiated region and corona discharge region, thereby selectively defining a substantially electrified portion of the corona discharge region, the adjustment means comprising a movable dimension-defining board arranged between the corona discharge means and light-emitting device, and a drive mechanism for moving the dimension-defining board radially with respect to the photosensitive drum to a prescribed position; the area of the overlapping portions of the corona discharge region and light-irradiated region varying with the position of the dimension-defining board.

4,326,795

IMAGE FORMING PROCESS AND APPARATUS THEREFOR

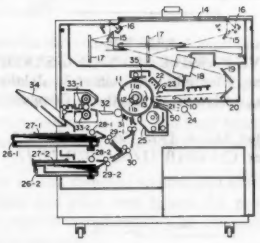
Hatsuo Tajima, Matsudo; Naoki Iwami, Tokyo; Shunichi Masuda, Tokyo; Katsuichi Shimizu, Hoya; Yoshihiro Kawatsura, Kawasaki; Koji Suzuki, Yokohama, and Yoshikazu Yokomizo, Kawagoe, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1979, Ser. No. 83,773

Claims priority, application Japan, Oct. 14, 1978, 53-126735; Oct. 14, 1978, 53-126737; Oct. 14, 1978, 53-126740

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 E **19 Claims**



1. Electrophotographic image forming apparatus, comprising:

charging means for electrostatically charging a photosensitive member;

light image projecting means for projecting a light image onto said photosensitive member charged by said charging means, thereby forming a latent image;

developing means for developing said latent images;

voltage applying means for applying a voltage to said developing means;

non-imaged area exposure means for projecting light onto a non-imaged area of said photosensitive member;

detecting means for detecting surface potential of a portion of said non-imaged area;

control means for controlling the light from said non-imaged area exposure means at a predetermined amount at said portions of said non-imaged area and for increasing said light to an amount in excess of said predetermined amount after completion of image formation to provide uniform conditions for subsequent image formation; adjusting means for adjusting the output voltage of said voltage applying means in response to a detection output of said detecting means.

4,326,796

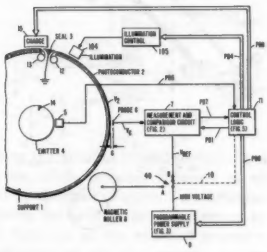
APPARATUS AND METHOD FOR MEASURING AND MAINTAINING COPY QUALITY IN AN ELECTROPHOTOGRAPHIC COPIER

James R. Champion, Longmont; Larry M. Ernst; Leland W. Ford, both of Boulder, and Ronald G. Velarde, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1979, Ser. No. 103,143

Int. Cl.³ G03G *15/02*

U.S. Cl. 355—14 CH **5 Claims**



1. Apparatus for measuring an unknown electrical charge on a photoconductor, including:

a moving surface carrying a conductor having a known reference charge and a photoconductor having an unknown charge, forming one plate of a capacitor;

a probe, spaced from said surface, forming a second plate of said capacitor, for sensing as a potential the charge on the photoconductor and conductor as a function of its distance therefrom;

a measurement circuit, having an input connected to the capacitor, an output for supplying sequences of pulses indicative of the potential of the conductor and the photoconductor relative to the conductor as the surface passes the probe, and a control input operable to identify the conductor passing the probe;

adjustable potential means, having an output associated with the probe operable in accordance with signals at an input to vary its output level; and

logic means, interconnecting the measurement circuit and potential means, for supplying adjustment signals to the potential means input as a function of sequences of pulses from the measurement circuit which vary the potential of the probe relative to the conductor until the voltage across the capacitor plates substantially equals a reference value.

4,326,797

COPYING APPARATUS CAPABLE OF CHANGING OVER THE COPYING MODE AND THE COPYING MAGNIFICATION

Koichi Miyamoto, Tokyo; Yasuhito Kan, Urawa; Hiroshi Nitanda, Tokyo, and Masao Ariga, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1980, Ser. No. 170,659

Claims priority, application Japan, Jul. 27, 1979, 54-95658

Int. Cl.³ G03B *27/34, 27/70*

U.S. Cl. 355—57 **15 Claims**

1. A copying apparatus having changeable copying modes and copying magnifications, comprising:

an original supporting table for supporting a three-dimensional original thereon;

a window located away from said original supporting table;

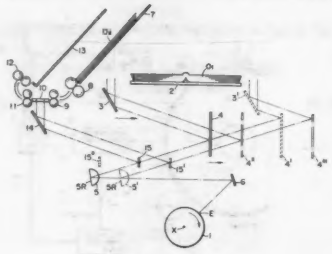
sheet original conveying means for conveying a sheet original past said window;

imaging means for forming an image of an original supported on said original supporting table or a sheet original

conveyed past said window on a photosensitive medium at a selected magnification;

a first optical system for scanning, in a first copy mode, an original supported on said original supporting table and directing a beam from the original to said imaging means; and

a second optical system for directing, in a second copy mode, the beam from the original conveyed by said conveying means, to the imaging means through said window, said second optical system including a mode-chang-



ing mirror which is movable to a retracted position, in the first copy mode, such that it is retracted out of the optical path for the sheet original conveyed by said sheet original conveying means, and which is movable, in the second mode, to one of a plurality of stationary operating positions, in accordance with the selected magnification, such that the beam from the sheet original conveyed by said sheet original conveying means is positioned in the optical path for the sheet orignal conveyed by said sheet original conveying means.

4,326,798

PYROMETER SYSTEM USING SEPARATED SPECTRAL COMPONENTS FROM A HEAT SOURCE

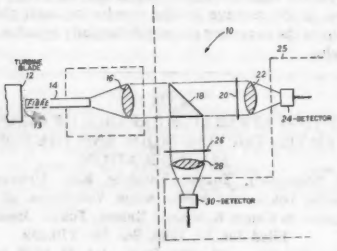
David A. Kahn, Southampton, England, assignor to Negretti & Zambra (Aviation) Limited, Hampshire, England

Filed Apr. 25, 1979, Ser. No. 33,252

Claims priority, application United Kingdom, Apr. 26, 1978, 16628/78

Int. Cl.³ G01J *5/18, 5/24*

U.S. Cl. 356—45 **6 Claims**



1. A pyrometer system for determining the temperature of a primary source of heat in an environment which is subject to the presence of a transient spurious source of heat at a substantially different temperature from that of said primary source, said system comprising:

means for receiving radiation from the primary and spurious sources of heat;

means for separating the received radiation into at least two radiation components including a first radiation component extending over a first preselected wavelength range and a second radiation component extending over a second preselected wavelength range whereby in the presence of radiation from said primary and spurious sources the relative proportions of the respective radiations in said first and second wavelength ranges are different from one another;

first detector means responsive to the radiation of said first radiation component for producing a first output signal;

first linearising means connected to receive said first output signal and to provide therefrom a first linear output signal that is representative of the temperature of said primary source in the absence of spurious radiation from said first radiation component;

second detector means responsive to the radiation of said second radiation component for producing a second output signal;

second linearising means connected to receive said second output signal and to provide therefrom a second linear output signal that is representative of the temperature of said primary source in the absence of spurious radiation from said second radiation component;

comparator means connected to receive said first and second linear output signals and to provide an error signal when a difference between said first and second linear output signals exceeds a predetermined magnitude;

a summing circuit for providing an average of said first and second linear output signals as a temperature output signal; and

a sample and hold circuit having an input, an output and a control input, said input being connected to receive said temperature output signal, said output being connected to an indication means and said control input being connected to receive said error signal whereby the operation of the sample and hold circuit is inhibited in the presence of said error signal.

4,326,799

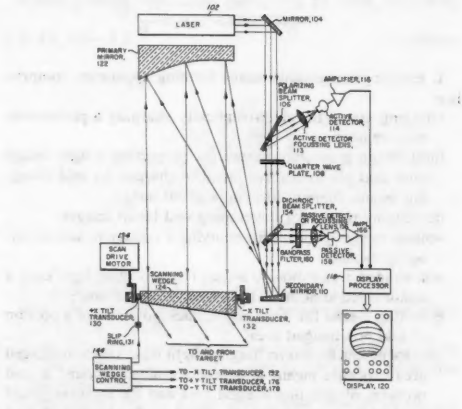
ACTIVE-PASSIVE SCANNING SYSTEM

Wayne H. Keene, Medfield, and Albert V. Jelalian, Bedford, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Aug. 6, 1975, Ser. No. 602,349

Int. Cl.³ G01B *11/26;* **G02B** *27/17*

U.S. Cl. 356—152 **13 Claims**



1. An active-passive scanning system comprising in combination:

a source of coherent light;

a rotating wedge for producing a scanning beam with said coherent light;

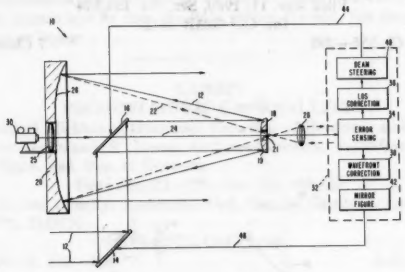
active detecting means;
means for producing a reference beam from a portion of said coherent light;
means for receiving a signal return beam;
means for tilting said wedge along at least one horizontal axis therethrough for aligning said reference beam and said signal return beam upon said active detector means; and
passive detecting means, at least a portion of said signal return beam being coupled to said passive detecting means.

4,326,800

LASER BEAM WAVEFRONT AND LINE-OF-SIGHT ERROR CORRECTION SYSTEM

John M. Fitts, Santa Monica, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 5, 1980, Ser. No. 146,958
Int. Cl.³ G01B *11/26*
U.S. Cl. 356—152 **5 Claims**



1. A system for directing an applied main laser beam along a preselected path, said system comprising:
beam sampling means for deriving from the main laser beam a sample laser beam which has a fixed preselected spatial orientation relative to the main laser beam;
laser means for providing a spatially stabilized pilot laser beam;
first sensor means, disposed to intercept at least a portion of the sample and pilot laser beams, for providing position control signals corresponding to the spatial orientation therebetween; and
first beam control means responsive to the position control signals for repositioning the main laser beam so as to cause a preselected spatial orientation to exist between the sample and pilot laser beams;
whereby the main laser beam is positioned and maintained at a preselected orientation relative to the pilot laser beam.

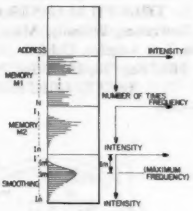
4,326,801

METHOD FOR EMISSION SPECTROCHEMICAL ANALYSIS

Junichi Ono; Isao Fukui, and Naoki Imamura, all of Kyoto, Japan, assignors to Shimadzu Seisakusho, Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 862,124, Dec. 12, 1977, abandoned. This application Jun. 26, 1980, Ser. No. 163,163
Claims priority, application Japan, Dec. 20, 1976, 51-153815
Int. Cl.³ G01N *21/66*
U.S. Cl. 356—313 **4 Claims**

1. A method of emission spectrochemical analysis comprising:
(a) producing a predetermined number of spark discharges between an electrode and a specimen containing an element in a first and second state;
(b) measuring the intensity of emission of light caused by each of said spark discharges;
(c) obtaining the frequency distribution of said measured intensities of emission;
(d) separating in said distribution an area of normal distribution and an area outside said area of normal distribution;
(e) selecting an intensity of emission value from said frequency distribution;



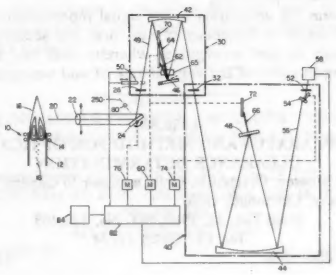
(f) determining the amount of said element in said first state as a function of the selected intensity of emission value multiplied by the area of normal distribution; and
(g) determining the amount of said element in said second state as a function of the selected intensity of emission value multiplied by the area outside the area of normal distribution.

4,326,802

DUAL MONOCHROMATOR TYPE OF SPECTROANALYSIS SYSTEM

Stanley B. Smith, Jr., Westford; Robert G. Schleicher, Winchester, and Allan G. Dennison, Acton, all of Mass., assignors to Instrumentation Laboratory Inc., Lexington, Mass.

Filed Feb. 6, 1980, Ser. No. 118,916
Int. Cl.³ G01N *21/73*; G01J *3/18*
U.S. Cl. 356—316 **37 Claims**



1. A spectroanalytical system comprising sample excitation source means,
a support,
first and second radiation dispersing elements mounted on said support,
means defining a stationary entrance aperture, means defining a stationary exit aperture,
means on said support for transmitting radiation from said source through said entrance aperture to said first dispersing means along a first optical path, for transmitting radiation dispersed by said first dispersing means to said second dispersing means along a second optical path, and for transmitting radiation dispersed by said second dispersing means through said exit aperture along a third optical path,
drive means carried by said support for moving said first and second dispersing elements simultaneously and at different rates such that the spectral order of radiation from said

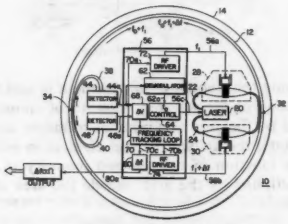
source dispersed by said first dispersing element and transmitted along said second optical path is different from the spectral order of radiation dispersed by said second dispersing element and transmitted along said third optical path through said exit aperture, and a radiation sensor responsive to radiation passing through said exit aperture.

4,326,803

THIN FILM LASER GYRO

Anthony W. Lawrence, Walpole, Mass., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Sep. 20, 1979, Ser. No. 77,381
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 **14 Claims**



1. A passive ring resonator laser gyro, comprising:

A. ring means including a thin film, passive waveguide adapted to provide a closed, passive propagation path for optical signals,

B. means for coupling first and second coherent optical signals into said waveguide, said optical signals being oppositely directed in said waveguide and having frequencies f_1 and f_2, respectively,

C. means for controlling the frequencies of said two optical signals whereby said waveguide is resonant at frequency f_1 and at frequency f_2 for said first and second optical signals, respectively,

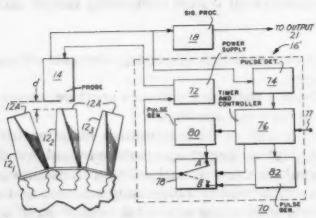
D. means for generating a rate signal representative of the difference in frequency of said first and second optical signals in said waveguide, whereby said rate signal is representative of the angular rate of said waveguide.

4,326,804

APPARATUS AND METHOD FOR OPTICAL CLEARANCE DETERMINATION

Paul W. Mossey, Greenhills, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Feb. 11, 1980, Ser. No. 120,408
Int. Cl.³ G01B *11/14*
U.S. Cl. 356—375 **12 Claims**



1. Apparatus for optically determining the clearance between the radial edge of at least one rotating blade member and a relatively stationary second member, which comprises:

(a) probe means adapted to be disposed in relatively fixed position with respect to said stationary second member for directing input light from an intermittent light source to said radial edge and for collecting output light scattered back from said radial edge, said probe means including probe output means responsive to the output light scattered back for developing a probe output signal; and

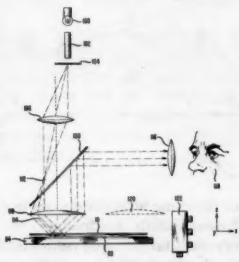
(b) signal processing means coupled to said probe output means for receiving said probe output signal and developing an intermediate electrical signal substantially representative of the instantaneous clearance between said radial edge and said second member, said signal processing means including synchronization means employing said intermittent light source for providing the presence of said input light at the time at which the clearance between said radial edge and said member is to be determined.

4,326,805

METHOD AND APPARATUS FOR ALIGNING MASK AND WAFER MEMBERS

Martin Feldman, New Providence; Alan D. White, Berkeley Heights, and Donald L. White, Bernardsville, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 11, 1980, Ser. No. 139,544
Int. Cl.³ G01B *11/27*
U.S. Cl. 356—399 **7 Claims**



1. In the fabrication of integrated circuits, a method of aligning spaced-apart mask and wafer members (**10,60**) which are each disposed perpendicular to a main longitudinal axis (**83**) of a lithographic system, each of said members having formed thereon two peripheral patterns (**12,20,61,62**) adapted for alignment purposes, each pattern on said mask member (**10**) overlying a pattern on said wafer member (**60**) to constitute an associated pair of patterns (**12,61** and **20,62**), each of the patterns on said members being responsive to incident illumination that conveys alignment mark information to form a focused image of said mark at a prescribed distance from said mask member, said method being characterized by the step of

illuminating each associated pair of patterns (**12,61**, and **20,62**) on said members (**10,60**) with an off-axis (**88,90**) optical beam.

4,326,806

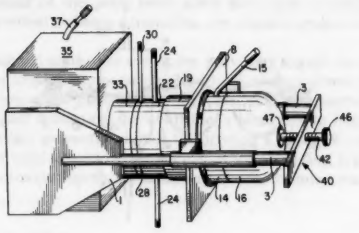
COPPER LIQUOR ANALYZER

Gary L. Donner, Palos Verdes Peninsula, Calif., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 20, 1979, Ser. No. 105,455
Int. Cl.³ G01N *21/85, 21/09*
U.S. Cl. 356—410 **7 Claims**

1. A copper liquor analyzer comprising sample cell means for having a portion of a stream of copper liquor flowing through it, means for passing light of a predetermined wavelength through the copper liquor in the sample cell means, and output means receiving the light passed through the copper liquor for providing an output corresponding to the strength of the copper liquor in accordance with the received light; and said sample cell means includes entrance means for receiving

the copper liquor and exit means for passing the copper liquor, light rays passage means for the passage of the light, arranged so that the entrance and exit means are connected to it, a pair of glasses, each glass having pores not greater than a predetermined size to prevent filling of the pores by copper and being



spacially arranged with the passageway means, the entrance means and the exit means, and first spacer means for separating the glasses in a manner so that the copper liquor flows between the glasses and so that the light passes through the flowing copper liquor.

4,326,807

PHOTOELECTRIC GAS ANALYZER

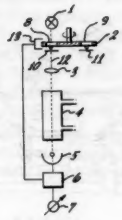
Michael Zöchbauer, Oberursel, Fed. Rep. of Germany, assignor to Hartmann & Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 22, 1980, Ser. No. 189,620

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1979, 2939735

Int. Cl.³ G01J *3/48*

U.S. Cl. 356—418 **8 Claims**



1. Photoelectric gas analyzer, for detecting the sum of the concentrations of NO and NO_2 in a gas and having a source of radiation, a cell containing the gas and disposed to receive radiation from the source, photoelectric detection means for receiving the radiation having passed through the cell, and circuit means connected to the detection means, the improvement comprising:

means for establishing two radiation beams traversing the same cell, and including

(i) a first interference filter adjusted to have a first transmission range outside any absorption band for NO to, thereby, establish one of the beams; and

(ii) a second interference filter, establishing the other one of the beams and being adjusted to have a second transmission range in an overlapping absorption region for NO and NO_2 in such a way that the effective absorption coefficient of NO_2 in the first transmission range of the first filter equals the difference of the absorption coefficients of NO_2 and NO in said second range; and

the source being a hollow cathode lamp filled with nitrogen and oxygen, the photoelectric detector means being responsive to the two beams and the circuit means constructed to provide an indication representing the sum of the concentrations of NO and NO_2.

4,326,808

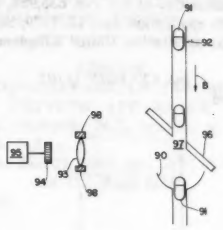
METHOD AND APPARATUS FOR DETERMINING PHYSICAL CHARACTERISTICS OF OBJECT OUTER SURFACES

Timothy R. Pryor; Omer L. Hageniers; Walter J. Pastorius; Nicholas Liptay-Wagner; Donald A. Clarke, all of Windsor, Canada, and Blaine Richards, Indianapolis, Ind., assignors to Diffracto Ltd., Ontario, Canada

Filed Feb. 27, 1979, Ser. No. 15,614

Int. Cl.³ G01N *21/55;* **G02B** *5/10*

U.S. Cl. 356—445 **34 Claims**



1. A method of determining the physical characteristics of the outer surface of an elongate object which comprises the steps of: providing a mirror member having a mirror surface in the form of a conical surface of revolution and having an aperture at its apex which passes through said mirror member; positioning an elongate cylindrical object in said aperture in axial alignment with the axis of said mirror surface; directing electromagnetic radiation in an axial direction onto said mirror surface and thence onto the outer cylindrical object surface; forming an image of said surface; scanning said image with a scanning electromagnetic radiation detector; and, analyzing the detected signals to determine a physical characteristic of said object surface.

4,326,809

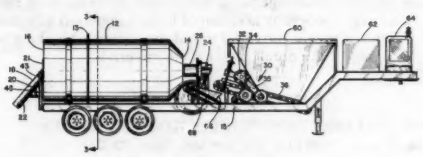
RECYCLING APPARATUS FOR ASPHALTIC CONCRETE

Robert L. Mendehall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Continuation-in-part of Ser. No. 871,351, Jan. 23, 1978, and Ser. No. 906,734, May 17, 1978. This application Apr. 14, 1980, Ser. No. 139,640

Int. Cl.³ B28C *5/42, 5/46*

U.S. Cl. 366—4 **15 Claims**



1. Apparatus for recycling asphaltic concrete compositon comprising:

a rotatable drum having a first port at a first end thereof open to atmosphere,

a burner adjacent said first end for introducing hot gases of combustion into said first port,

a second port at a second end of said drum having closure means for closing said second port,

means for recovering composition from said second port, and

wherein said closure means and said means for recovering composition cooperate to maintain said second port closed except to the extent necessary to recover composition therethrough, and whereby substantially all of said hot gases of combustion introduced into said drum are vented to atmosphere through said first port.

4,326,810

MIXING DEVICES

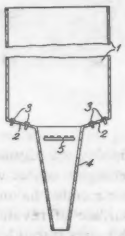
Clive Schofield, Stevenage, and John E. P. Miles, Buntingford, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 847,493, Nov. 7, 1977, abandoned, which is a continuation of Ser. No. 636,958, Dec. 2, 1975, abandoned. This application Apr. 13, 1979, Ser. No. 29,907

Claims priority, application United Kingdom, Dec. 9, 1974, 53108/74

Int. Cl.³ B01F *13/02*

U.S. Cl. 366—106 **8 Claims**



1. A process for mixing and/or homogenising finely divided cohesive materials having a tendency to channel comprising:

loading the materials into a container having a base including at least one material outlet port and a number of individually distinctly directed nozzle air ways;

supplying the container with an air flow;

applying said air flow to said individually distinctly directed nozzle air ways;

converting said air flow into a number of discrete discharges from respective air ways in the form of air jets each having a velocity of at least 100 feet per second and preferably 250 feet per second for each 8 cubic feet per minute supplied by the air flow at an overall rate of between 5 and 20 cubic feet per minute per square foot of base area;

orienting the air ways to direct the discrete discharges downwardly towards and across the base and the outlet port in intersecting angularly spaced directions;

independently producing said air discharges in a predetermined sequence; and

mixing and/or homogenising the loaded materials with said discharges, whereby aeration of loaded materials adjacent the outlet port is provided to reduce cohesive blocking or bridging of the outlet port by the materials.

4,326,811

SEALESS PRESSURIZED MIXING VESSELS

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Jan. 10, 1977, Ser. No. 758,141

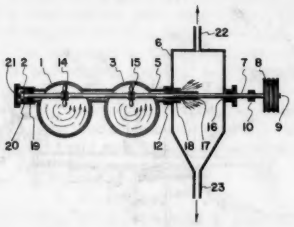
Int. Cl.³ B01F *7/06*

U.S. Cl. 366—290 **6 Claims**

1. A mixing device for agitating and blending fluid materials in mineral or in chemical processing, said device comprising:

(a) a cylindrical vessel disposed horizontally so that its axis is on a horizontal plane, said cylindrical vessel having an inlet and an outlet whereby material to be processed can be fed into and discharged from said vessel;

(b) a first propeller disposed adjacent to the cylindrical wall of said cylindrical vessel whereby rotation of said first propeller generates a thrust in a direction tangential to the cylindrical surfaces coaxial to the axis of said cylindrical vessel, said thrust creating a rotational mixing motion of the fluid material about the axis of said cylindrical vessel; and



(c) wherein a plurality of said devices are aligned parallel to each other forming a train of vessels, two adjacent vessels of said train of vessels connected to each other by a spool, whereby each propeller in each vessel of said train of vessels is driven by a single shaft running through said spools interconnecting adjacent vessels.

4,326,812

NON IMPACT PRINTER

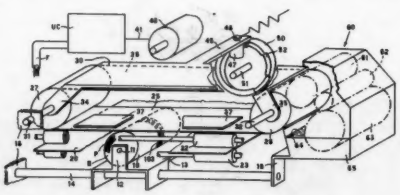
Arnaldo Pasini, Ivrea, and Franco Knirsch, Banchette, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jul. 17, 1980, Ser. No. 169,844

Claims priority, application Italy, Jul. 20, 1979, 68569 A/79

Int. Cl.³ B41J *3/02*

U.S. Cl. 400—121 **15 Claims**



1. A non-impact dot-matrix printer for printing alphanumeric characters on a printing medium, comprising an electrode wheel having a row of electrodes spaced axially along the periphery of the wheel, means for supporting the printing medium between the wheel and an ink carrier, means for selectively energising the electrodes relative to the ink carrier with electrical pulses which cause dots of ink to transfer from the ink carrier to the printing medium, and means arranged to move the electrode wheel transversely with a rolling, non-sliding movement relative to the recording medium, along a print line.

4,326,813

DOT MATRIX CHARACTER PRINTER CONTROL CIRCUITRY FOR VARIABLE PITCH PRINTING

Roy F. Lomicka, Jr., Chelmsford, and Peter N. Heller, Newton, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 955,525, Oct. 30, 1978, abandoned. This application Oct. 23, 1979, Ser. No. 87,681

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **22 Claims**

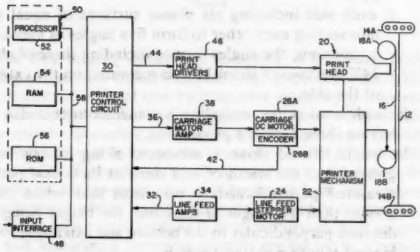
1. A control system for a dot matrix character printer for

printing characters of selectable pitch, which includes a print head containing at least one column of dot printing means, means for moving the print head relative to a medium on which characters are to be printed, and transition generator means for providing print head motion signals responsive to movement of the print head, each basic unit of print head displacement defining a transition, the control system comprising:

sequential controller means for providing signals to effectuate sequential operation of portions of the control system;

the sequential controller means providing a request-to-print signal indicating the controller's readiness to begin supplying sequential signals for printing a string of columns;

print head actuation control means for providing print head actuation signals for actuating the dot printing means;



the print head actuation control means being adapted to enable printing responsive to the concurrence of the request-to-print signal and a print head motion signal indicating arrival of the print head at the location where the column of dot printing means is to be actuated for printing the first column of a string of columns, such location being one of a multiplicity of predetermined locations; and

the sequential controller means being adapted to provide, and the print head actuation control means being further adapted to accept, a request-to-print signal independent of the position of the print head,

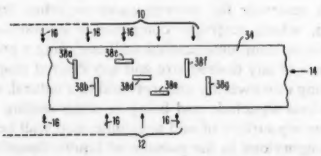
whereby a request-to-print signal can be provided at any point to initiate printing at the next one of said predetermined locations reached by the moving print head.

4,326,814

DOCUMENT PRINTING DEVICE HAVING A PLATEN WITH CHARACTER SEGMENTS THEREON

Robert R. Schaffer, Endwell, and Dean W. Skinner, Binghamton, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 19, 1980, Ser. No. 131,573
Int. Cl.[3] B41J *3/06*
U.S. Cl. 400—125.1 **8 Claims**



1. Apparatus for printing on a document, said apparatus comprising:

(a) a document feed path defined in and through said apparatus,

(b) a platen, non-movably and fixedly mounted in said apparatus adjacent said document feed path, said platen having a plurality of character segments formed thereon;

(c) a plurality of movable impact members, there being at least one impact member associated with each of said character segments, said impact members being movably mounted adjacent said document feed path proximate to said platen and positioned there so that said impact members when moved will strike its associated character segment;

(d) document feeding means for feeding a document along said document feed path; and

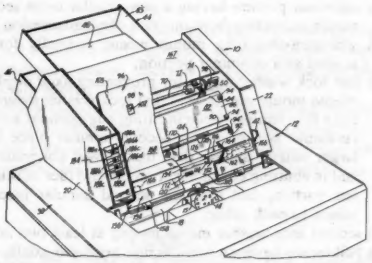
(e) control means for selectively moving predetermined combinations of said impact members in timed relationship to the motion of a document along said document feed path to cause said moved impact members to strike their associated character segments.

4,326,815

PAPER FEEDING APPARATUS AND METHOD FOR PRINTING APPARATUS

Ludwig J. Kapp, Montville, N.J., assignor to Ziyad Incorporated, Denville, N.J.

Filed Jan. 21, 1980, Ser. No. 114,115
Int. Cl.[3] B41J *11/58*
U.S. Cl. 400—625 **71 Claims**



1. Paper feeding apparatus for a printing device, said printing device including a transversely extending platen, a printing head transversely movable relative to said transversely extending platen, and a guide member for guiding a sheet of paper in a desired direction, said guide member being associated with said transversely movable print head and movable therewith, said transversely extending platen including paper drive means for providing relative longitudinal movement of a sheet of paper relative to said printing head to effect printing on said sheet of paper by transversely moving said printing head relative to said transversely extending platen and by longitudinally moving a sheet of paper relative to said printing head, said paper feeding apparatus comprising:

paper storing means for storing a plurality of individual sheets of paper;

paper feed means for feeding a sheet of paper in a paper feed direction from said paper storing means to said platen, said sheet of paper having a longitudinal central portion which extends in the paper feed direction and which is centrally located intermediate the edges of said sheet of paper which extends in the paper feed direction;

paper receiving means for receiving a sheet of paper from said platen, said paper receiving means defining a paper exit path having one end arranged adjacent said platen to receive a sheet of paper therefrom after said printing means has effected printing thereon; and

centering means for transversely moving said print head and associated guide member to be in a position to overlie at least a part of the central portion of said sheet of paper when it is moved therepast upon initial feeding of a sheet of paper to said platen so that said guide member cooperates with said platen to guide said sheet of paper into said

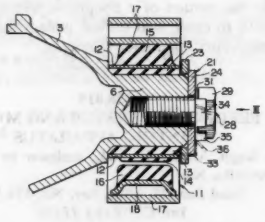
paper exit path as said sheet is moved past said guide member.

4,326,816

TRANSMISSION SUPPORT ASSEMBLY IN VEHICLE

Kunio Morisawa, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 28, 1980, Ser. No. 153,949
Claims priority, application Japan, Jun. 26, 1979, 54-79680
Int. Cl.³ F16D *1/00*; F16J *1/38*
U.S. Cl. 403—228 **6 Claims**



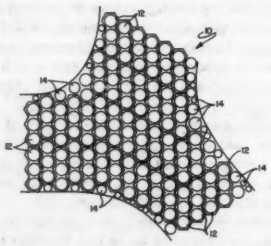
1. A transmission support assembly in a vehicle comprising:
a columnar portion having a non-circular cross section and axially extending from one end of a transmission housing;
a vibration-absorbing mount means coaxially force-fitted around said columnar portion;
a first lock washer means for preventing axial displacement of said mount means, said first lock washer means including a first annular piece in fitting engagement around said columnar portion and a second annular piece having a larger outer diameter than that of said columnar portion and in abutting engagement on the end face of said columnar portion, said first and second annular pieces being joined to each other;
a second lock washer means having at least two tabs; and
a bolt means having a non-circular head and axially screwed into said columnar portion for fastening said first and second lock washer means to said columnar portion,
the tabs of said second lock washer means engaging respectively the second annular piece of said first lock washer means and the head of said bolt for preventing relative rotation.

4,326,817

PAVING STONE AND WALKWAY FORMED THEREWITH

Mario J. Boiardi, Oneida Dr., Greenwich, Conn. 06830

Filed Feb. 22, 1980, Ser. No. 123,574
Int. Cl.³ E01C *5/00, 15/00*
U.S. Cl. 404—41 **2 Claims**



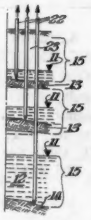
1. An array of paving stones forming a curved walkway wherein the upper surface portion of each stone includes one or more projections with generally flat upper surfaces curving downwardly at the outer edge thereof; said projections being generally circular in plan view;
said stones including individual stones circular in cross-section disposed only near the edges of said walkway, the top surface of each individual stone including a single said projection which is generally circular and planar and which at its outer edge slopes downwardly toward the cylindrical side of the stone,
additional paving stones comprising a majority of the surface area of the walkway with said additional paving stones being uniform in size and configuration, said additional paving stones having:
a. two sides and two ends,
b. the ends being planar and parallel to each other,
c. an axis bisecting the two ends,
d. in plan view the stone being symmetrical about said axis,
e. each side including six planar surfaces of equal area intersecting each other to form five angles as viewed in a plan view, the angles formed including three of about 240° and two of about 120° as measured on the exterior of the side,
the additional stones including a planar bottom and a top having three elevated projections,
the length of said stone as measured along its axis being greater than the width of said stone at its widest part as measured perpendicular to said axis, said width being greater than the height of the stone, the height being the distance perpendicular to the bottom and extending to the highest point on any projection,
said individual stones serving to fill the gaps left between said additional stones and at least one smoothly-curved edge of said walkway.

4,326,818

TECHNIQUES FOR THE STORAGE OF WATER

Dudley L. Willis, 108 Briar La., Newark, Del. 19711

Continuation of Ser. No. 951,738, Oct. 16, 1978, which is a continuation of Ser. No. 848,716, Nov. 4, 1977. This application Jan. 29, 1980, Ser. No. 116,642
Int. Cl.³ B65G *5/00*
U.S. Cl. 405—55 **10 Claims**



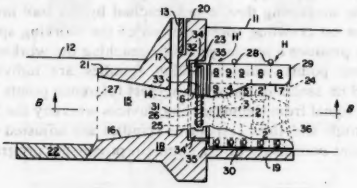
1. A reservoir for storing water or other liquids underground, which reservoir comprises a substantially flexible, impervious, continuous closed wall enclosing a predetermined land area of any desired size and any desired shape, said wall extending downwardly underground to a natural, substantially impervious aquiclude and being in water-sealing relationship with the top surface of said aquiclude, said wall being substantially impervious to the passage of liquids therethrough, said wall being made of a grouting material which will yield to natural ground movement without failure, said wall extending downwardly to said aquiclude and being horizontally supported by the soil on either side thereof, said water being stored within the voids between the soil particles within said reservoir.

4,326,819

FUNCTIONALLY TRANSFORMABLE HYDROSTATION

Francisco J. G. Atencio, Estafeta Dr. Garcia, 3101 Diamante Entre Rios, Argentina

Filed Nov. 19, 1979, Ser. No. 95,351
Int. Cl.[3] E02B 9/08
U.S. Cl. 405—78 8 Claims



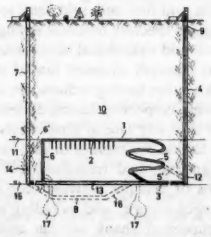
1. A fluid storing installation including, a main dam body having a fluid flow conduit therethrough provided with opposite open ends, at least one hydromotive assembly juxtaposed said dam body adjacent one said open end of said conduit, said hydromotive assembly provided with a fluid flow conduit therethrough, said hydromotive assembly conduit substantially horizontally disposed and axially aligned with said dam body conduit, an energy generation unit having at least one component disposed within said hydromotive assembly conduit and adapted to be actuated by fluid flow therethrough, said generation unit including a generator directly connected to a turbine runner, said hydromotive assembly conduit having a first open end and an opposite second open end for discharging fluid flows entering said first open end, said hydromotive assembly including a gate within said hydromotive assembly conduit operable to controllably vary the volume of fluid flow discharging through said conduit second open end and means for displacing said hydromotive assembly towards and away from said dam conduit when said hydromotive assembly is respectively positioned at or removed from said dam body.

4,326,820

FINAL DEPOSITORY FOR RADIOACTIVE WASTES

Ernst-Peter Uerpmann, Osterode; Gerhard Staupendahl, Clausthal-Zellerfeld, and Manfred Schmidt, Goslar, all of Fed. Rep. of Germany, assignors to Gesellschaft für Strahlen-und Umweltforschung mbH München, Neuherberg, Fed. Rep. of Germany

Filed Nov. 28, 1978, Ser. No. 964,140
Int. Cl.[3] E21F 17/16; G21F 9/24
U.S. Cl. 405—128 9 Claims



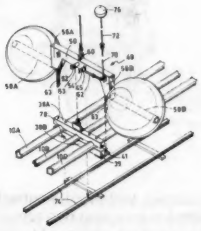
1. A final depository located underground for storing radioactive wastes contained in storable shielded containers, comprising: at least one shaft extending downwardly from the ground surface; an underground passage; a radioactive waste storage region located above said underground passage and presenting a dry, solid floor for supporting the wastes; and means defining at least one connecting passage extending downwardly from said storage region to at least one of said shaft and underground passage, said means causing all fluid communication with said storage region to be directed exclusively downwardly from said floor.

4,326,821

INSTALLING SUBMERGED PIPELINE

Walter L. Stefens, Santa Barbara, Calif., assignor to Solus Ocean Systems, Inc., Houston, Tex.

Filed Jul. 31, 1980, Ser. No. 173,828
Int. Cl.[3] F16L 1/04
U.S. Cl. 405—171 19 Claims



1. A system for installing submerged pipe lines comprising means for non-abrasively gripping at least one pipeline at longitudinally spaced intervals and supporting the same vertically spaced above the seabed

detachable buoyant wheel means for permitting said pipeline to be pulled along out of contact with the seabed, and

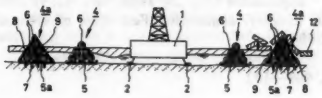
means for detaching and retrieving said wheel means after the pipeline has been pulled to a predetermined location.

4,326,822

ARTIFICIAL ISLAND FOR INSTALLING OIL DRILLING EQUIPMENT IN ICE COVERED SEA AREAS

Masanao Oshima, Tokyo, and Nobuyoshi Yashima, Funabashi, both of Japan, assignors to Mitsui Engineering and Shipbuilding Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1979, Ser. No. 97,899
Claims priority, application Japan, Nov. 30, 1978, 53-148878; Nov. 30, 1978, 53-148879
Int. Cl.[3] E02B 17/00
U.S. Cl. 405—217 18 Claims

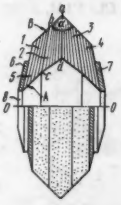


1. An artificial island for installing oil drilling equipment in ice covered sea areas, comprising at least two rows of ice barricades for surrounding at least a portion of oil drilling equipment in ice covered sea water, the top portion of each said barricades projecting above the surface of the sea water, means provided at the bottom portion of at least the outermost one of said barricades to fix said barricade to the sea-bottom, and inclined ice breaking wall means provided at a side of at least the outermost one of said barricades which is opposite the side of said barricade which faces the oil drilling equipment, wherein said rows of barricades are separated from one another such that a space is formed therebetween, said space receiving at least a portion of the ice broken by said inclined ice breaking walls.

4,326,823
ROTATING CUTTING TOOL

Evgeny I. Beznosjuk, proezd Shokolskogo, 27, korpus 2, kv. 182, Moscow; Leonid B. Doktorov, Leningradskoe shosse, 18, kv. 27, Khimki Moskovskoi oblasti; Vyacheslav E. Musyakin, Sirenevy-Bulvar 36, kv. 51, and Sergei V. Kolomeets, Volgogradsky Prospect 164, korpus 2, kv. 95, both of Moscow, all of U.S.S.R.

Filed May 29, 1980, Ser. No. 154,212
Int. Cl.³ B26D *1/12*
U.S. Cl. 407—51 **4 Claims**



1. A rotating cutting tool (needle-cutter) comprising cutting elements assembled at least into two sets; said cutting elements are essentially pieces of wire fastened to one another at one end while other ends thereof are free: the fastened ends of said cutting elements form the internal non-working surface; the free ends of said cutting elements constitute the working surface in the form of a disc with the side edges thereof arranged at an angle substantially equal to 90°; the diameter of each said cutting element and the mean length thereof in a set are represented by the following mutually equal ratios

$$d_1^4/l_{S1}^2 = d_2^4/l_{S2}^2 = \ldots d_n^4/l_{Sn}^2,$$

where:

$d_1, d_2 \ldots d_n$ are the diameters of the cutting elements in sets;

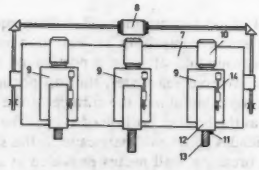
$l_{S1}, l_{S2} \ldots l_{Sn}$ are the mean lengths of the cutting elements in sets;

1, 2 . . . n are the numbers of sets.

4,326,824
PROCESS FOR LONGITUDINAL ADJUSTMENT OF TOOLS

Franz Lasermann, and Eduard Wittenbreder, both of Bielefeld, Fed. Rep. of Germany, assignors to Firma Droop, Bielefeld and Herr Dipl.-Ing. M. G. Dronsek, Klingen, both of, Fed. Rep. of Germany

Division of Ser. No. 938,873, Sep. 1, 1978, abandoned. This application May 27, 1980, Ser. No. 152,993
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1977, 2739533
Int. Cl.³ B23C *1/08*; B23B *49/00*
U.S. Cl. 409—132 **5 Claims**

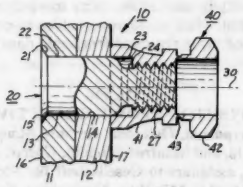


1. A process for longitudinal adjustment of tools each in one of a plurality of individual working spindles of a multiple-spindle automatically controlled machine tool, from a respective working-part reference point established through respective measuring devices as a zero-point coordinate of a common processing program; the process characterized in that the tools are introduced into their respective working spindles in the direction of the individual tool lengths to be adjusted and are run in rapid advance in all cases against a respective measuring device in which the first of the tools on reaching a predetermined distance from the working-part reference point produces a first signal in which the rapid advances of the remaining spindles are stopped individually, whereby the first signal from the measuring device last reached by the tool involved switches on crawling speeds for all of the working spindles, each to produce a second signal on reaching the working-part reference points which working spindles are individually stopped on reaching the working-part reference points by the second signal from the measuring devices whereby the plurality of tools and their respective spindles are adjusted to the zero point coordinate of the common processing program.

4,326,825
BALANCED PIN FOR SHEAR FLOW JOINT, AND JOINT INCLUDING THE PIN

Josef F. Volkmann; Edwin E. Hatter, both of Torrance, and Michael M. Schuster, Santa Monica, all of Calif., assignors to Hi Shear Corporation, Torrance, Calif.

Filed Dec. 31, 1979, Ser. No. 108,959
Int. Cl.³ F16B *5/02, 31/02, 35/00*
U.S. Cl. 411—5 **25 Claims**



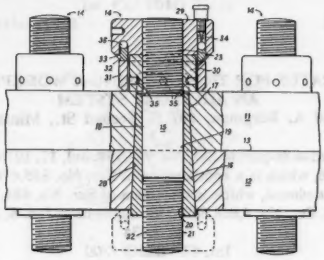
1. A metallic balanced shear flow pin having a first and a second end and a central axis, said fastener comprising a head section, a cylindrical shank section, a transition section, a neck section, and a peripheral groove on said neck section, said sections being coaxial with one another, and provided in the order recited from said first end, said head section and peripheral groove having respective inherent strengths to resist axial tensile forces, and said cylindrical shank section having a respective inherent strength to resist lateral shear forces, said cylindrical shank section having a diameter, and said head and neck sections having respective lateral dimensions, said diameter being smaller than any lateral dimensions of said head and greater than any lateral dimensions of said neck section and of said peripheral groove, said transition section reducing the lateral dimensions of said pin between said cylindrical shank section and said neck section, and including a shoulder contiguous to said cylindrical shank section and a non-threaded intersection contiguous to said neck, said pin being made of material which can be work-hardened, and said intersection being work-hardened the better to resist fatigue forces, said inherent strengths of said head section and peripheral groove being substantially equal and only sufficient to resist axial tensile forces exerted by bending in a shear flow joint, and said inherent strength of said cylindrical shank section being sufficient to resist shear forces in said joint.

4,326,826

BOLTS AND METHODS OF BOLTING

Thomas W. Bunyan, London, England, assignor to Pilgrim Engineering Developments Limited, London, England

Filed Jun. 4, 1979, Ser. No. 45,199
Int. Cl.³ F16B 35/00
U.S. Cl. 411—339 9 Claims



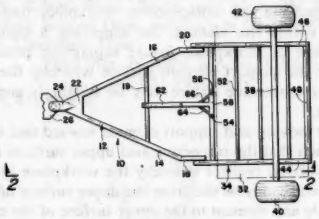
1. A tapered dowel bolt comprising a tapered shank having a broader end and a narrower end, said shank comprising an inner member and an outer member, said outer member having a circumferentially continuous tapered outer surface to mate with a coaxial continuous tapered bore in one or more workpieces, and an axially-extending unthreaded cylindrical bore, said inner member having a cylindrical outer surface which is a close sliding fit in said cylindrical bore, said inner member being anchored to said outer member only at the broader end of said shank and including a portion projecting from said outer member at said narrower end of said shank, and means on said projecting portion of said shank securing abutment means to said inner member.

4,326,827

HAY BALE HANDLING APPARATUS

Darrell A. McNutt, Highway 70 East, Soper, Okla. 74759

Filed Jul. 25, 1980, Ser. No. 172,156
Int. Cl.³ B60P 1/08
U.S. Cl. 414—24.5 8 Claims



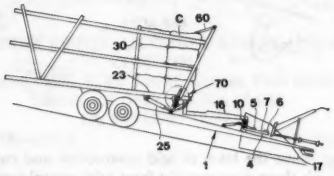
1. Apparatus for handling cylindrical objects and adapted to be secured to a towing vehicle, said apparatus comprising A-frame means having hitch means provided at one end thereof for connection with the vehicle, wheel supported cradle means pivotally secured to the opposite end of the A-frame means for retrieving and carrying said cylindrical object thereon, means secured between the A-frame means and cradle means for limiting the movement of the cradle means in one direction, bail means pivotally secured to the cradle means and freely movable in one direction for engaging the outer periphery of the object during retrieval thereof, said bail means being of an arcuate configuration of a size at least slightly greater than half the outer circumference of the object whereby the bail encircles the object throughout more than half the circumference thereof, and spring means secured between the A-frame means and bail means for urging the bail in a direction away from engagement with the object and precluding engagement of the bail means with the A-frame means during carrying of the object for transporting thereof.

4,326,828

BALE WAGONS

Jean-Pierre Guenon, Plombieres-les-Dijon, France, assignor to Sperry Corporation, New Holland, Pa.

Filed Aug. 20, 1980, Ser. No. 179,901
Claims priority, application United Kingdom, Aug. 25, 1979, 29690/79
Int. Cl.³ A01D 87/12; B65G 57/32
U.S. Cl. 414—39 3 Claims



1. In a bale wagon having a frame, a bale pickup means mounted on said frame for lifting bales from the ground; a bale receiving table mounted on said frame adjacent said bale pickup means onto which the lifted bales are transferred; said bale receiving table being moveable between a first bale loading position and a second bale unloading position; a load bed mounted on said frame adjacent said bale receiving table for receiving bales from said bale receiving table, said bale receiving table being operable to sequentially transfer a number of bales formed in a tier onto said load bed to form a stack of a plurality of tiers thereon, the improvement comprising:

bale retaining spikes moveable between a first operative position in which the bale retaining spikes project upwardly through apertures in the load bed to penetrate the underside of each of the lowermost bales of the tier of bales last transferred to the load bed by the bale receiving table and a second inoperative position where the bale retaining spikes are withdrawn beneath said apertures;

slides mounted on the underside of the load bed proximate to said apertures for guiding the bale retaining spikes for sliding movement; and

linkage means between the bale receiving the table and the bale retaining spikes so that movement of the bale retaining spikes relative to the slides and to the load bed occurs with movement of the bale receiving table, such that the bale retaining spikes are in the first operative position when the bale receiving table is in said first bale loading position and in the second operative position when the bale receiving table is in said second bale unloading position.

4,326,829

APPARATUS FOR LIFTING A HEAVY LOAD AND TRANSPORTING IT OVER AN OBSTRUCTION

Aurindo Nessi, Albate, Italy, assignor to Innocenti Santeustacchio S.p.A., Italy

Filed Jan. 23, 1980, Ser. No. 114,695
Claims priority, application Italy, Feb. 12, 1979, 20116 A/79
Int. Cl.³ B65G 67/02
U.S. Cl. 414—357 4 Claims

1. An apparatus for lifting a heavy load and transporting it over an obstruction, comprising an overhead travelling crane having;

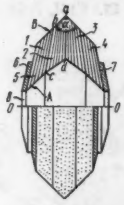
a supporting bridge structure;

a first set of horizontal, parallel rails carried by said bridge structure and extending in the direction of transport of the load above the level of said obstruction;

4,326,823
ROTATING CUTTING TOOL

Evgeny I. Beznosjuk, proezd Shokolskogo, 27, korpus 2, kv. 182, Moscow; Leonid B. Doktorov, Leningradskoe shosse, 18, kv. 27, Khimki Moskovskoi oblasti; Vyacheslav E. Musyakin, Sireneyy-Bulvar 36, kv. 51, and Sergei V. Kolomeets, Volgogradsky Prospect 164, korpus 2, kv. 95, both of Moscow, all of U.S.S.R.

Filed May 29, 1980, Ser. No. 154,212
Int. Cl.³ B26D 1/12
U.S. Cl. 407—51 4 Claims



1. A rotating cutting tool (needle-cutter) comprising cutting elements assembled at least into two sets; said cutting elements are essentially pieces of wire fastened to one another at one end while other ends thereof are free: the fastened ends of said cutting elements form the internal non-working surface; the free ends of said cutting elements constitute the working surface in the form of a disc with the side edges thereof arranged at an angle substantially equal to 90°; the diameter of each said cutting element and the mean length thereof in a set are represented by the following mutually equal ratios

$$d_1^4/l_{S1}^2 = d_2^4/l_{S2}^2 = \ldots d_n^4/l_{Sn}^2,$$

where:

$d_1, d_2 \ldots d_n$ are the diameters of the cutting elements in sets;

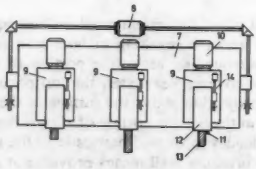
$l_{S1}, l_{S2} \ldots l_{Sn}$ are the mean lengths of the cutting elements in sets;

1, 2 . . . n are the numbers of sets.

4,326,824
PROCESS FOR LONGITUDINAL ADJUSTMENT OF TOOLS

Franz Lasermann, and Eduard Wittenbreder, both of Bielefeld, Fed. Rep. of Germany, assignors to Firma Droop, Bielefeld and Herr Dipl.-Ing. M. G. Dronsek, Klingen, both of, Fed. Rep. of Germany

Division of Ser. No. 938,873, Sep. 1, 1978, abandoned. This application May 27, 1980, Ser. No. 152,993
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1977, 2739533
Int. Cl.³ B23C 1/08; B23B 49/00
U.S. Cl. 409—132 5 Claims

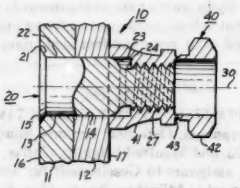


1. A process for longitudinal adjustment of tools each in one of a plurality of individual working spindles of a multiple-spindle automatically controlled machine tool, from a respective working-part reference point established through respective measuring devices as a zero-point coordinate of a common processing program; the process characterized in that the tools are introduced into their respective working spindles in the direction of the individual tool lengths to be adjusted and are run in rapid advance in all cases against a respective measuring device in which the first of the tools on reaching a predetermined distance from the working-part reference point produces a first signal in which the rapid advances of the remaining spindles are stopped individually, whereby the first signal from the measuring device last reached by the tool involved switches on crawling speeds for all of the working spindles, each to produce a second signal on reaching the working-part reference points which working spindles are individually stopped on reaching the working-part reference points by the second signal from the measuring devices whereby the plurality of tools and their respective spindles are adjusted to the zero point coordinate of the common processing program.

4,326,825
BALANCED PIN FOR SHEAR FLOW JOINT, AND JOINT INCLUDING THE PIN

Josef F. Volkmann; Edwin E. Hatter, both of Torrance, and Michael M. Schuster, Santa Monica, all of Calif., assignors to Hi Shear Corporation, Torrance, Calif.

Filed Dec. 31, 1979, Ser. No. 108,959
Int. Cl.³ F16B 5/02, 31/02, 35/00
U.S. Cl. 411—5 25 Claims



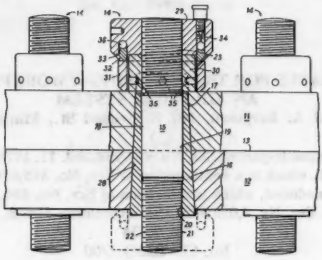
1. A metallic balanced shear flow pin having a first and a second end and a central axis, said fastener comprising a head section, a cylindrical shank section, a transition section, a neck section, and a peripheral groove on said neck section, said sections being coaxial with one another, and provided in the order recited from said first end, said head section and peripheral groove having respective inherent strengths to resist axial tensile forces, and said cylindrical shank section having a respective inherent strength to resist lateral shear forces, said cylindrical shank section having a diameter, and said head and neck sections having respective lateral dimensions, said diameter being smaller than any lateral dimensions of said head and greater than any lateral dimensions of said neck section and of said peripheral groove, said transition section reducing the lateral dimensions of said pin between said cylindrical shank section and said neck section, and including a shoulder contiguous to said cylindrical shank section and a non-threaded intersection contiguous to said neck, said pin being made of material which can be work-hardened, and said intersection being work-hardened the better to resist fatigue forces, said inherent strengths of said head section and peripheral groove being substantially equal and only sufficient to resist axial tensile forces exerted by bending in a shear flow joint, and said inherent strength of said cylindrical shank section being sufficient to resist shear forces in said joint.

4,326,826

BOLTS AND METHODS OF BOLTING

Thomas W. Bunyan, London, England, assignor to Pilgrim Engineering Developments Limited, London, England

Filed Jun. 4, 1979, Ser. No. 45,199
Int. Cl.³ F16B *35/00*
U.S. Cl. 411—339 9 Claims



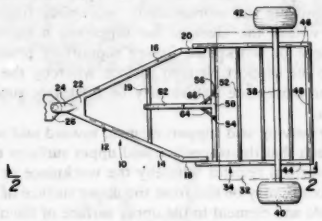
1. A tapered dowel bolt comprising a tapered shank having a broader end and a narrower end, said shank comprising an inner member and an outer member, said outer member having a circumferentially continuous tapered outer surface to mate with a coaxial continuous tapered bore in one or more workpieces, and an axially-extending unthreaded cylindrical bore, said inner member having a cylindrical outer surface which is a close sliding fit in said cylindrical bore, said inner member being anchored to said outer member only at the broader end of said shank and including a portion projecting from said outer member at said narrower end of said shank, and means on said projecting portion of said shank securing abutment means to said inner member.

4,326,827

HAY BALE HANDLING APPARATUS

Darrell A. McNutt, Highway 70 East, Soper, Okla. 74759

Filed Jul. 25, 1980, Ser. No. 172,156
Int. Cl.³ B60P *1/08*
U.S. Cl. 414—24.5 8 Claims



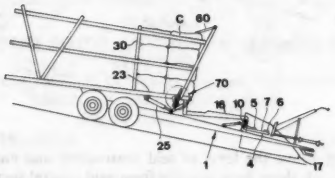
1. Apparatus for handling cylindrical objects and adapted to be secured to a towing vehicle, said apparatus comprising A-frame means having hitch means provided at one end thereof for connection with the vehicle, wheel supported cradle means pivotally secured to the opposite end of the A-frame means for retrieving and carrying said cylindrical object thereon, means secured between the A-frame means and cradle means for limiting the movement of the cradle means in one direction, bail means pivotally secured to the cradle means and freely movable in one direction for engaging the outer periphery of the object during retrieval thereof, said bail means being of an arcuate configuration of a size at least slightly greater than half the outer circumference of the object whereby the bail encircles the object throughout more than half the circumference thereof, and spring means secured between the A-frame means and bail means for urging the bail in a direction away from engagement with the object and precluding engagement of the bail means with the A-frame means during carrying of the object for transporting thereof.

4,326,828

BALE WAGONS

Jean-Pierre Guenon, Plombieres-les-Dijon, France, assignor to Sperry Corporation, New Holland, Pa.

Filed Aug. 20, 1980, Ser. No. 179,901
Claims priority, application United Kingdom, Aug. 25, 1979, 29690/79
Int. Cl.³ A01D *87/12*; B65G *57/32*
U.S. Cl. 414—39 3 Claims



1. In a bale wagon having a frame, a bale pickup means mounted on said frame for lifting bales from the ground; a bale receiving table mounted on said frame adjacent said bale pickup means onto which the lifted bales are transferred; said bale receiving table being moveable between a first bale loading position and a second bale unloading position; a load bed mounted on said frame adjacent said bale receiving table for receiving bales from said bale receiving table, said bale receiving table being operable to sequentially transfer a number of bales formed in a tier onto said load bed to form a stack of a plurality of tiers thereon, the improvement comprising:

bale retaining spikes moveable between a first operative position in which the bale retaining spikes project upwardly through apertures in the load bed to penetrate the underside of each of the lowermost bales of the tier of bales last transferred to the load bed by the bale receiving table and a second inoperative position where the bale retaining spikes are withdrawn beneath said apertures;

slides mounted on the underside of the load bed proximate to said apertures for guiding the bale retaining spikes for sliding movement; and

linkage means between the bale receiving the table and the bale retaining spikes so that movement of the bale retaining spikes relative to the slides and to the load bed occurs with movement of the bale receiving table, such that the bale retaining spikes are in the first operative position when the bale receiving table is in said first bale loading position and in the second operative position when the bale receiving table is in said second bale unloading position.

4,326,829

APPARATUS FOR LIFTING A HEAVY LOAD AND TRANSPORTING IT OVER AN OBSTRUCTION

Aurindo Nessi, Albate, Italy, assignor to Innocenti Santeustacchio S.p.A., Italy

Filed Jan. 23, 1980, Ser. No. 114,695
Claims priority, application Italy, Feb. 12, 1979, 20116 A/79
Int. Cl.³ B65G *67/02*
U.S. Cl. 414—357 4 Claims

1. An apparatus for lifting a heavy load and transporting it over an obstruction, comprising an overhead travelling crane having;

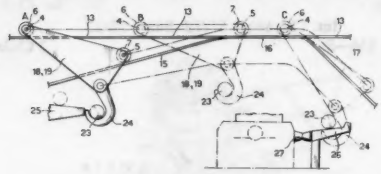
a supporting bridge structure;

a first set of horizontal, parallel rails carried by said bridge structure and extending in the direction of transport of the load above the level of said obstruction;

a carriage having a front axle and a rear axle with respect to said direction of transport, each axle being provided with wheels and the wheels of one of said front or rear axles being engaged each with a respective rail of said first set of rails to support the carriage thereon; and

drive means for driving said carriage along said rails, wherein

said bridge structure carries a second set of rails, each rail of which is disposed in a plane parallel to said direction of transport and includes a central, horizontal section extend-



ing above the level of said obstruction and end sections which slope downwardly from said central section, and

the wheels of the other of said front or rear axles being engaged each with a respective rail of said second set of rails to lower said carriage at an angle with respect to said first set of horizontal, parallel rails during movement of said wheels of said other of said front or rear axles over the end sections of said second set of rails, the carriage having load support means at its end adjacent said other of said front and rear axles.

4,326,830

SIDE LOADING VEHICLE

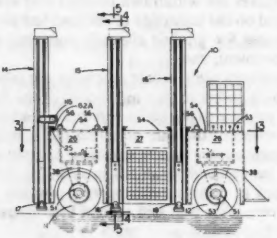
Lawrence B. Cusack, 2495 Rosewood Ave., Kamloops, British Columbia, da (V2B 4Z3)

Filed May 6, 1980, Ser. No. 147,108

Claims priority, application United Kingdom, May 15, 1979, 16915/79

Int. Cl.³ B60P *1/16, 1/32, 1/34, 1/52*

U.S. Cl. 414—470 **17 Claims**



1. A self-propelled side loading vehicle comprising:

(a) a chassis supported on front and rear pairs of wheels and having three box shaped sections separated by two transversely elongate clear ways extending from one side of the chassis to a rigid frame along a side of the chassis opposite the one side;

(b) three mast members received on guide tracks mounted on the chassis and having means for independent transverse movement within the two clear ways and along one end of the chassis, each mast member comprising upper and lower telescopic sections and a fluid cylinder for raising and lowering the upper section; and

(c) a load-bearing assembly supported by the upper section of each mast member comprising an outwardly extending bracket connected to a roller chain, the chain extending about a powered sprocket for raising and lowering the bracket connected to the chain, the bracket having a transversely extending, horizontal roller for supporting a load.

4,326,831

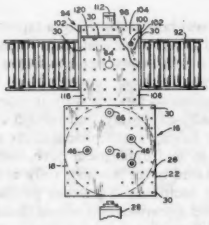
APPARATUS FOR TRANSFERRING A WORKPIECE IN AN AIR FLOAT SYSTEM

Raymond A. Bergman, 107 E. Second St., Minster, Ohio 45865

Continuation-in-part of Ser. No. 924,958, Jul. 17, 1978, Pat. No. 4,179,106, which is a continuation of Ser. No. 815,676, Jul. 14, 1977, abandoned, which is a division of Ser. No. 684,725, May 10, 1976, Pat. No. 4,058,885. This application Jan. 8, 1979, Ser. No. 1,434

Int. Cl.³ B23Q *7/00*

U.S. Cl. 414—676 **25 Claims**



1. A workpiece transfer system comprising:

a support table having an upper surface adapted for supporting a workpiece or workpiece fixture and means within the table for supplying a cushion of workpiece or fixture supporting pressurized fluid to the surface of first table whereby the workpiece or workpiece fixture may be floatingly supported thereon,

a movable support element having an upper surface adapted for supporting the workpiece or workpiece fixture and means within the element for supplying a cushion of workpiece or workpiece fixture supporting pressurized fluid to the support element surface whereby the workpiece or workpiece fixture may be floatingly supported thereon,

means for moving said support element toward said support table such that the respective said upper surfaces thereof are in vertical register whereby the workpiece or workpiece fixture may be slid from the upper surface of one of said table and element to the upper surface of the other of said table and element, and for moving said support element away from said table when the workpiece or fixture has been thus transferred from said one of said table and element to the other,

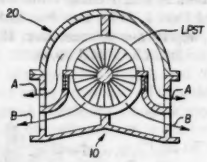
said support table and said support element each comprising: a capture pin received within its said upper surface and means for selectively extending the capture pin to protrude above the respective upper surface and enter a downwardly facing opening in the workpiece or workpiece fixture supported on the upper surface to thereby capture the workpiece or workpiece fixture so supported, and means for selectively retracting the capture pin to release the workpiece or workpiece fixture, whereby the workpiece or workpiece fixture can be positively captured by one or both of the pins as it is transferred from the support table to the support element or from the support element to the support table.

4,326,832

EXHAUST OUTER CASING

Takashi Ikeda, Tokyo, and Shinya Ayano, Fujisawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 12, 1979, Ser. No. 84,446
Claims priority, application Japan, Nov. 14, 1978, 53/140037
Int. Cl.³ F01D 25/26
U.S. Cl. 415—219 R 2 Claims



1. An exhaust outer casing for a steam turbine wherein a low pressure steam turbine is constructed by an inner casing for supporting a rotatable turbine blade and an outer casing for supporting the inner casing, and said outer casing is adapted to connect to a condenser, the exhaust outer casing comprising:

a base;

a lower casing mounted on the base for supporting the inner casing and having means for receiving steam flow from the upper portion of the inner casing separately from the steam flow from the lower portion of the inner casing, and outlet means for discharging said steam flow laterally outward from the sides of the lower casing, and

an upper casing mounted on the lower casing and having means for introducing the flow to the inner casing to rotate the turbine,

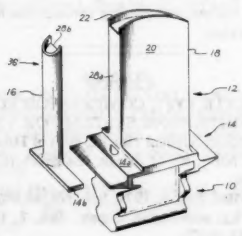
wherein the bottom of the lower casing is inclined from its opposite sides to the middle thereof.

4,326,833

METHOD AND REPLACEMENT MEMBER FOR REPAIRING A GAS TURBINE ENGINE BLADE MEMBER

John W. Zelahy, West Chester, and Alexander Raeburn, Jr., Fairfield, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Mar. 19, 1980, Ser. No. 131,606
Int. Cl.³ F01D 5/14
U.S. Cl. 416—96 R 4 Claims



3. A replacement member for a segment of a gas turbine engine air cooled blade, the blade including a base, an airfoil and a platform therebetween generally extending beyond the airfoil, the airfoil projecting longitudinally from the platform and having chordwise spaced leading and trailing edge portions interconnected by concave and convex sidewalls, at least one edge portion having an edge chamber extending longitudinally of the airfoil and extending chordwise into the airfoil toward the other edge portion to a longitudinally extending chamber wall, the replacement member comprising:

a longitudinal portion including

(a) an edge portion; and

(b) a part of the chamber wall connected with and facing the edge portions;

(c) the edge portion and an interior surface of the chamber wall part facing the edge portion defining walls of the edge chamber; and

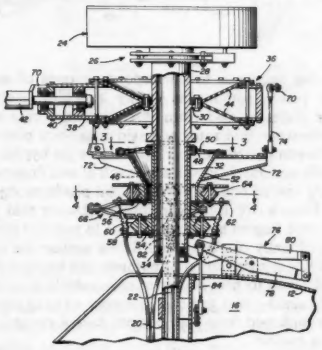
a foot portion connected with the longitudinal portion and comprising a part of the platform connected with and extending from the edge portion and connected with the edge chamber.

4,326,834

HELICOPTER ROTOR ASSEMBLY AND BLADE PITCH CONTROL

Stanislaw Ostrowski, P. O. Box 61, Gusher, Utah 84030

Filed Jun. 5, 1979, Ser. No. 45,698
Int. Cl.³ B64C 27/52
U.S. Cl. 416—134 A 16 Claims



1. A helicopter rotor assembly including upright journaled support shaft means, an annular hub loosely disposed about said shaft means, a pair of annular flexible and resilient diaphragms having their outer peripheral portions anchored relative to axially spaced first inner marginal peripheral zones of said hub and their inner peripheral portions anchored relative to second peripheral zones of said shaft means oppositely axially spaced relative to the radial planes in which the corresponding first zones are disposed, said diaphragms each being radially stretched, and thus functioning in opposition to each other to yieldingly resist axial displacement of said hub relative to said shaft means from a predetermined position therealong and further function in concert to yieldingly resist angular displacement of the plane of rotation of said hub relative to a predetermined plane generally normal to the axis of rotation of said shaft means.

4,326,835

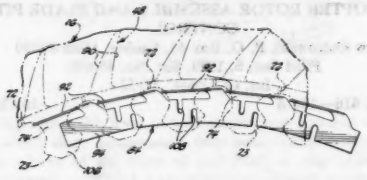
BLADE PLATFORM SEAL FOR CERAMIC/METAL ROTOR ASSEMBLY

John L. Wertz, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 29, 1979, Ser. No. 89,179
Int. Cl.³ F01D 5/30
U.S. Cl. 416—193 A 1 Claim

1. In a high temperature gas turbine engine ceramic and metal turbine rotor assembly of the type including a metal rotor disc having a rim with a plurality of circumferentially spaced retention slots therein and end faces thereon, and a plurality of ceramic blades, each blade including side platform

segments thereon, a blade stalk and a dependent dovetail configured root slidably received in one of said slots, adjacent ones of said platform segments including edge portions thereon closely spaced when said blades are assembled on said disc to form a substantially closed bottom surface for gas flow through said blades, an improved platform seal assembly comprising a plurality of seal members each having a flat ring segment and a plurality of integral fingers disposed generally at 90° to the plane of said ring segment, each of said seal members being fabricated from a high temperature resistant metal and being on the order of 0.005 inches in thickness so that each of said fingers is highly flexible yet light in weight, a plurality of blade connector plates corresponding in number to the number of said seal members and adapted for disposition on one of said rotor disc end faces, means rigidly attaching respective ones of



said flat ring segments to corresponding ones of said blade connector plates, and means rigidly attaching each of said connector plates to said rotor disc with said ring segments captured between said rotor and said connector plate thereby to seal between said blade stalks to prevent gas bypass therebetween while accurately positioning each of said fingers beneath said closely spaced edge portions of said platform segments so that said fingers overlap a gap found between said platform segments, said fingers being responsive to rotation of said disc to be centrifugally displaced and flexed against the underside of said platform segments to distribute seal loads at the edge portions thereon to prevent stress concentrations at the platform while sealing said gap therebetween so as to prevent gas bypass through said blade flow path bottom during operation of the gas turbine engine.

4,326,836

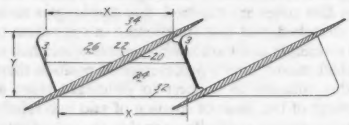
SHROUD FOR A ROTOR BLADE

David L. Fitton, South Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 13, 1979, Ser. No. 103,145

Int. Cl.³ F01D *5/22*

U.S. Cl. 416—196 R **6 Claims**



1. For a rotor blade of the type used in gas turbine engines which has an airfoil disposed about a spanwisely extending axis and a shroud extending laterally from the airfoil, the improvement which comprises:

a shroud having

a laterally outward portion having a contact surface which adapts the rotor blade to engage a contact surface on an adjacent shroud of an adjacent rotor blade in the installed condition in the engine,

a laterally inward portion extending between and integrally joined to the laterally outward portion and the airfoil for providing support to the laterally outward portion;

wherein said inward portion of the shroud has a geometric contour, said geometric contour having dimensions that cause the inward portion of the shroud to exhibit a maximum fiber unit stress in a rotational force field that is nearly uniform throughout the lateral length of the inward portion of the shroud.

4,326,837

PUMPING APPARATUS USING A STEPPING MOTOR

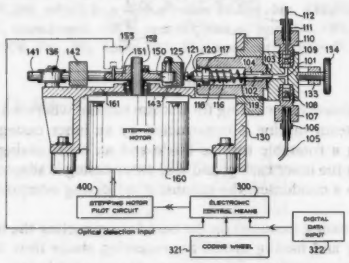
Robert E. Gilson; George W. Foster, both of Middleton, Wis., and Alain M. Bonneyrat, St-Martin-du-Tertre, France, assignors to Gilson Medical Electronics, Villiers-le-Bel, France

Filed Dec. 3, 1979, Ser. No. 99,867

Claims priority, application France, Dec. 15, 1978, 78 35399

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—12 **12 Claims**



1. In pumping apparatus of the type comprising an inlet duct, an outlet duct, at least one pump body having a chamber which communicates through inlet and outlet valves with these two ducts, a piston movable in a fluid-tight manner in this chamber, as well as a cyclic actuator of the rotary cam type co-operating with this piston to cause it to slide, and a motor driving the cam, the improvement in which the motor is a fine-step stepping drive unit, and associated therewith are control means suitable for regulating the movement of the stepping motor as a function of a required delivery flow rate and as a function of a required stroke and return speed of the piston, said fine-step stepping drive unit comprises a stepping motor as such, associated with a pilot circuit, and the latter reacts to control signals by selectively passing into the windings of the stepping motor a current determined in accordance with a reference value which is in turn scaled in accordance with the control signals, this enabling the number of motor steps to be multiplied, said pilot circuit is adapted to apply to the individual windings of the stepping motor a periodically cut-off voltage of predetermined repetition rate and having a form factor defined by comparison of the current passing through each winding with the reference value.

4,326,838

SWASH PLATE TYPE COMPRESSOR FOR USE IN AIR-CONDITIONING SYSTEM FOR VEHICLES

Kenichi Kawashima; Kiyoshi Horibe, both of Hitachi, and Takashi Degawa, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 6, 1979, Ser. No. 46,042

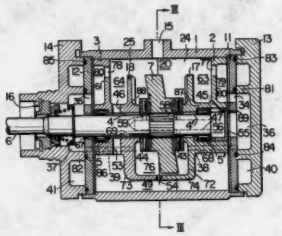
Claims priority, application Japan, Jun. 7, 1978, 53-67704; Jul. 28, 1978, 53-91479

Int. Cl.³ F04B *1/16*

U.S. Cl. 417—269 **4 Claims**

1. A swash plate type compressor for use in an air-conditioning system for vehicles, comprising a pair of cylinder blocks having a plurality of cylinder bores; a rotary shaft rotatably supported by said cylinder blocks; a swash plate fixed to said rotary shaft and disposed at a center of said cylinder blocks; pistons engageable with said swash plate and slidingly movable in said cylinder bores upon an oscillatory rotation of said swash

plate; side covers attached to the ends of said cylinder blocks through respective valve plates; a suction chamber formed in each of said side covers; a refrigerant suction passage formed in a portion of said cylinder blocks between adjacent cylinder bores above the rotary shaft for communicating a suction inlet of the compressor with the suction chambers by way of first passage bores formed in said valve plates; a crank chamber disposed at the center of said cylinder blocks and defined by partition walls enclosing a space in which said swash plate oscillatorily rotates, an opening being formed in a peripheral portion of said partition walls opposite said suction inlet for communicating said crank chamber with said refrigerant suction passage; an oil chamber disposed below said rotary shaft and around said crank chamber and defined between said cylinder bores in said cylinder blocks, said oil chamber being substantially closed except that said oil chamber is in communication with said crank chamber through a second passage bore formed in a portion of said partition walls between said crank chamber and said oil chamber, and said oil chamber having



substantially no direct communication with said suction chambers; and third passage bores formed in hubs of the respective cylinder blocks in parallel relationship with a shaft bore in said cylinder blocks accommodating said rotary shaft, each of said third passage bores having a first end opening directly into said crank chamber and a second end directly communicating with a bottom of an associated suction chamber through an associated valve plate whereby during operation of the compressor a refrigerant flow passage extends from said suction inlet to said suction chambers through said opening in said peripheral portion of said partition walls, said crank chamber and said third passage bores; during a halt in operation of the compressor lubricating oil accumulated in said suction chambers is returned to said oil chamber through said crank chamber by way of said third passage bores and said second passage bore; and during a start in operation of the compressor, when boiling of the lubrication oil in said oil chamber takes place due to foaming, oil is sprayed through said second passage bore from said oil chamber into said crank chamber so that said swash plate is lubricated.

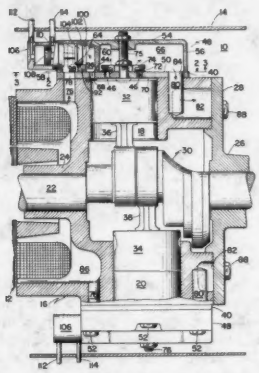
4,326,839

CYLINDER UNLOADING MECHANISM FOR REFRIGERATION COMPRESSOR

Emanuel D. Fry, Tecumseh, Mich., and Herbert G. Siewert, Sylvania, Ohio, assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Dec. 6, 1979, Ser. No. 101,228
Int. Cl.³ F04B 49/00
U.S. Cl. 417—295 **9 Claims**

1. In a hermetic refrigeration compressor comprising: a hermetically sealed outer housing, a block in said housing and having at least one cylinder therein, a reciprocably movable piston in each cylinder, means including a cylinder head in said housing for closing an end of said cylinder and having suction and discharge ports therein communicating with said cylinder, said cylinder head having suction and discharge chambers therein respectively communicating with said suction and discharge ports, an access opening in said head, said closing means having suction and discharge passages respectively communicating with said suction and discharge chambers, spring biased suction valve means for normally closing said suction port and being opened in response to a suction stroke of said piston, and spring biased discharge valve means for normally closing said discharge port and being opened in response to a discharge stroke of said piston, a cylinder unloading mechanism comprising: a partition in said cylinder head extending across said suction chamber between said suction passage and suction port and dividing said suction chamber into first and second sections, said partition having an unloading port therein communicating with said first and second suction chamber sections; an unloading valve having a closed position closing said unloading port thereby blocking communication between said suction chamber sections to unload said cylinder, and an



open position permitting communication between said sections; and means for actuating said unloading valve between said closed and open positions in response to a control signal, said means for actuating said unloading valve comprising: a double acting springless return fluid motor connected to said access opening in the head and comprising a plunger cylinder connected to said access opening having a double acting plunger therein, said plunger extending through the access opening and being connected to said valve, said plunger dividing the plunger cylinder into two chambers, and a selectively actuatable pilot valve means connected to said plunger cylinder chambers for alternatively connecting said plunger cylinder chambers to a source of fluid pressure, whereby the unloading valve is opened and closed in accordance with the state of said pilot valve.

4,326,840

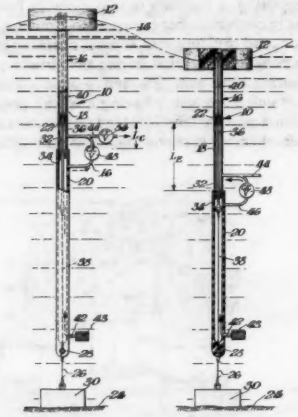
WAVE DRIVEN PUMP

Douglas C. Hicks, Newark, Del., and Charles M. Pleass, Havre de Grace, Md., assignors to University of Delaware, Newark, Del.

Filed Mar. 10, 1980, Ser. No. 129,037
Int. Cl.³ F03B 3/12
U.S. Cl. 417—331 **10 Claims**

1. A wave driven pump comprising a buoyant wave follower for floating at the water surface, an elongated hollow body member connected to and depending from said wave follower for extending toward the sea floor, said body member including means for mooring said body member to the sea floor, a piston in said body member having means for mooring to the sea floor whereby the relative distance between said piston and the sea floor is maintained generally constant, said body member including a hollow cylinder connected to said wave follower and disposed around and in contact with said piston, a pumping chamber in said cylinder upstream from said piston with one end of said pumping chamber being closed by

said piston, said cylinder including a bushing defining the opposite end of said pumping chamber remote from said piston inlet means communicating with said pumping chamber and adapted to communicate with the surrounding sea water, outlet means communicating with said pumping chamber for the discharge of seawater therefrom, and means for expanding and



contracting the volume of said pumping chamber in response to wave movements for creating a pumping action which causes sea water to flow into said pumping chamber and then be pumped therefrom and a portion of said elongated hollow body member being made of a resilient elastic material to permit said member to change in length in accordance with the position of said wave follower.

4,326,841

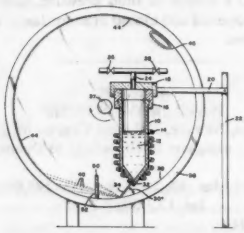
APPARATUS FOR MAKING METALLIC GLASS POWDER

Ranjan Ray, Randolph, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 23,412, Mar. 23, 1979, Pat. No. 4,221,587. This application Feb. 25, 1980, Ser. No. 124,407

Int. Cl.³ B22F 9/00

U.S. Cl. 425—8 **4 Claims**



1. An apparatus for making metallic glass powder comprising:

(a) holding means for holding molten metal;

(b) nozzle means in communication with said holding means for generating a jet of molten metal;

(c) means for expelling molten metal through said nozzle means to generate a jet of molten metal;

(d) a rotatable cylindrical chill body having an inner chill surface, wherein the nozzle means and the chill body are so positioned with respect to each other that a molten metal jet expelled from the nozzle means impinges against the inner surface of the chill body in the direction of movement of the chill surface at an acute angle within the range of from about 5° to about 30°.

4,326,842

DEVICE FOR THE PULVERIZATION OF RADIOACTIVE WASTES

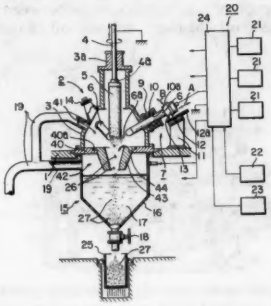
Toshio Adachi, Nagoya, and Susumu Hiratake, Kasugai, both of Japan, assignors to Daidotokushuko Kabushikikaisha, Japan

Filed Jan. 24, 1980, Ser. No. 115,155

Claims priority, application Japan, Jan. 27, 1979, 54-8326

Int. Cl.³ G21F 9/34

U.S. Cl. 425—10 **8 Claims**



1. A pulverising device comprising:

(i) a hollow furnace body defining a space for the melting of a portion of radioactive waste,

(ii) a gripper mounted on said furnace body and adapted to support a portion of radioactive waste in said space in said furnace body,

(iii) plasma torch means mounted on said furnace body and directed to irradiate a plasma arc toward a lower end of said portion of radio-active waste supported by said gripper, and

(iv) a water vessel disposed below said space for storage of water,

whereby said portion of radio-active waste is heated so as to be melted within said space by said plasma arc, and the molten waste falls as a succession of drops into said water and becomes pulverised.

4,326,843

GAS-FIRED INFRA-RED GENERATORS AND USE THEREOF

Thomas M. Smith, 114 Villinger Ave., Cinnaminson, N.J. 08077

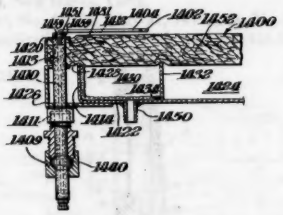
Continuation-in-part of Ser. No. 906,229, May 15, 1978, Pat. No. 4,157,155, Ser. No. 863,251, Dec. 22, 1977, Pat. No. 4,224,018, and Ser. No. 775,838, Mar. 9, 1977, Pat. No. 4,272,237, said Ser. No. 863,251, and Ser. No. 775,838, each is a continuation-in-part of Ser. No. 701,687, Jul. 1, 1976, abandoned, said Ser. No. 775,838, and Ser. No. 701,687, each is a continuation-in-part of Ser. No. 674,409, Apr. 7, 1976, Pat. No. 4,035,132. This application Oct. 18, 1978, Ser. No. 952,332

Int. Cl.³ F23Q 3/00

U.S. Cl. 431—264 **9 Claims**

9. An electrical ignition assembly containing a ground electrode rod bent into at least about one-sixth but not more than half of a circle and secured in place at each of its ends, a sparking electrode rod mounted at a point corresponding to the center of the ground electrode circle and having a terminal

portion extending in the plane of the circular portion of the ground electrode and to within sparking distance of it, and a



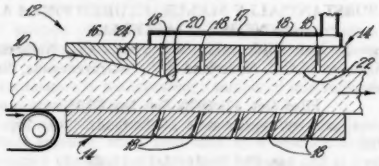
proving electrode mounted within the area defined by the bent ground electrode.

4,326,844

METHOD AND APPARATUS FOR CURING FIBROUS MINERAL MATERIAL

Ronald E. Kissell, Alexandria, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 25, 1980, Ser. No. 181,274
Int. Cl.³ F27B *14/00*
U.S. Cl. 432—13 **12 Claims**



9. The method for curing fibrous mineral material of the type in which fibrous mineral material containing heat curable or thermoplastic binder thereon is passed through a curing station having a cool zone and a curing element positioned downstream from said cool zone, said curing element being adapted to apply heat and pressure to the surface of the fibrous mineral material passed through said curing station to cure the binder and said curing element defining a hot zone and a transition zone positioned between said cool zone and said hot zone, wherein the improvement comprises applying greater pressure to the fibrous mineral material in said transition zone than in either said cool zone or said hot zone.

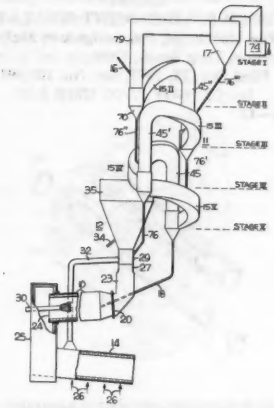
4,326,845

SUSPENSION PREHEATER FOR CEMENT CALCINING PLANT

Paul D. Hess, Brookfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jan. 2, 1981, Ser. No. 222,035
Int. Cl.³ F27B *7/02, 15/00*
U.S. Cl. 432—106 **19 Claims**

1. A multi-stage cement calcining plant suspension preheater having a plurality of stages each of which has a separator for separating raw cement meal from gas in which the meal is suspended and wherein said separators of said plurality of stages are serially connected and in series with a calcining combustor, characterized in that the separators in certain of said stages are helical duct inertial separators each of which comprises a hollow elongated continuous duct having its longitudinal axis disposed generally along a downwardly inclined helical path with its inlet end at a higher elevation than its outlet end, said duct having adjacent said inlet end a gas inlet opening in a vertical plane for receiving a generally horizontal gas stream with cement meal suspended therein, means including a downwardly inclined upper wall and a concave outer side wall for deflecting said horizontal stream into a downwardly inclined helical path within said duct, a generally horizontal bottom wall in the path of the helically downward directed gas stream, a meal exit opening in said bottom wall adjacent said outlet end, and a gas exhaust opening in the top



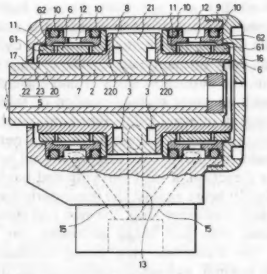
wall adjacent said outlet end, whereby said helically downward directed gas stream impinges upon said bottom wall and is deflected upward toward said gas exhaust opening while the heavier meal is urged by centrifugal and inertial forces to precipitate from said gas stream and flow along said bottom wall toward said meal exit opening.

4,326,846

DENTAL HANDPIECE

Hiroshi Sugai, and Shoji Nakayama, both of Kyoto, Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Continuation-in-part of Ser. No. 889,646, Mar. 24, 1978. This application Feb. 25, 1980, Ser. No. 124,451
Claims priority, application Japan, Apr. 10, 1977, 52/37810
The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.
Int. Cl.³ A61C *1/12*
U.S. Cl. 433—132 **3 Claims**



1. A dental handpiece comprising turbine blades of a single turbine driven by applying a high-speed fluid under pressure through a high-speed fluid supply apperture coupled to a turbine rotor chucking a cutting shaft, said turbine rotor being journaled in bearings and said aperture facing said blades,

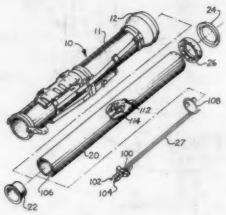
wherein said blades are provided with openings or cutout portion located at both outside ends in a thrust direction of said blades so as to provide flange portions between said openings and said end portions of said blades and the width of said blades at a periphery thereof is larger than that of said high-speed fluid supply apperture.

4,326,847

LAUNCH ENVIRONMENT SIMULATOR

George W. Roe, Rockledge, Fla., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Dec. 21, 1979, Ser. No. 105,991
Int. Cl.³ F41F *27/00*; G09B *9/00*
U.S. Cl. 434—12 **12 Claims**



1. A launch environment simulation apparatus comprising:
a. an elongated combustion chamber open at both ends;
b. means for charging the chamber with a combustible gas mixture;
c. means for igniting the gas selectable by an operator;
d. a recoil producing means comprising a plate removably attached to the rear end of the chamber wherein the plate contains at least one orifice such that the total orifice area provides an effective amount of recoil sensible to the operator of the apparatus upon ignition of the gas mixture; and
e. means for containing the combustible gas mixture within the chamber prior to ignition of the gas comprising end caps removably attached to both ends of the chamber wherein the caps disintegrate upon ignition of the gas.

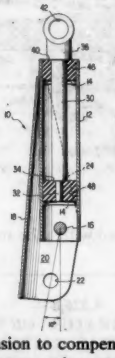
4,326,848

CONSTANT BELT TENSION DEVICE

Larry T. George, Greenfield, and Herbert W. Egan, Jr., Indianapolis, both of Ind., assignors to Wallace Murray Corporation, New York, N.Y.

Filed Apr. 21, 1980, Ser. No. 142,434
Int. Cl.³ F16H *7/12*
U.S. Cl. 474—135 **5 Claims**

2. A constant-tension spring device for the accessory belt of an automobile engine, the device including, a cylindrical housing having at least one annular elastomer ring member positioned therein, the outermost sides of said elastomer ring being in contact with an inner surface portion of said cylinder, the housing having an internal ledge abutment constantly contacting said elastomer ring to maintain the outer periphery of one end face of said ring fixed with respect to said cylinder against forces in one direction, a load carrying rod having a shoulder which constantly bears against the inner periphery of the other end face of said elastomer ring, the said rod shoulder being of lesser diameter than said ledge abutment, the improvement comprising, the elastomer ring being substantially uncompressed in its normal, unloaded configuration, the sides of the ring being unbonded to thereby permit the ring sides to move away from the interior surface of the cylindrical housing, whereby movement of the rod shoulder towards the abutment causes the elastomer ring to undergo torsion about its circular axis, to thereby result in a flat segment over a portion of the load vs. deflection curve of the device, whereby the device may be operated along the flat segment of the load vs. deflection curve, to cause an accessory belt of an automotive engine



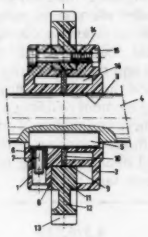
to have a constant tension to compensate for changes in belt length due to temperature, ageing, and humidity.

4,326,849

SPROCKET-WHEEL GEAR-WHEEL OR LIKE WHEEL SUBSTANTIALLY MANUFACTURED FROM A SYNTHETIC MATERIAL

George J. Van Zijderveld, 's-Gravenzande, Netherlands, assignor to M.C.C. Nederland B.V., 's-Gravenzande, Netherlands

Filed Oct. 17, 1979, Ser. No. 85,753
Claims priority, application Netherlands, Jul. 26, 1979, 7905788
Int. Cl.³ F16H *55/12, 55/48*
U.S. Cl. 474—161 **4 Claims**



1. A sprocket-wheel, gear-wheel or like wheel substantially manufactured from a synthetic material and comprising a hub and a toothed ring or the like affixed thereto in spaced concentric relationship therewith, said hub being divided along a plane which lies substantially perpendicular to the centre-line of the hub-boring such that the hub comprises two parts of substantially annular form, the opposing radial surfaces of which are each provided with an open and radially outward directed recess of substantially annular form and with an outwardly facing periphery of non-circular form, in which both said recesses jointly accommodate a part of substantially annular form which is affixed to the said toothed ring, in which the radially inwardly facing periphery of said part corresponds in form to the said outwardly facing peripheries of the recesses in two hub parts, and in which the two hub parts are affixed to one another by fixing means which also clamps the said part affixed to the toothed ring therebetween in the recesses.

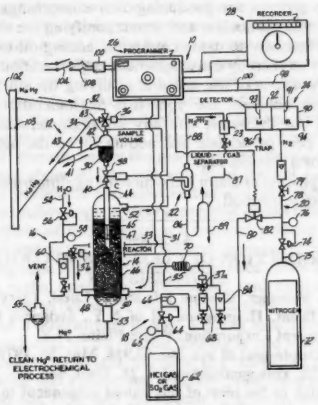
4,326,850
SODIUM AMALGAM MONITOR

Italo A. Capuano; Patricia A. Turley, both of Orange, and Edward W. DuBord, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 44,295, May 31, 1979, Pat. No. 4,294,798. This application Apr. 28, 1980, Ser. No. 144,505

Int. Cl.³ G01N *27/62*

U.S. Cl. 23—230 R **21 Claims**



1. A method of monitoring the sodium concentration in a sodium-mercury amalgam process stream which comprises the steps of:

(a) automatically withdrawing a sample of said sodium-mercury amalgam from said stream;

(b) automatically supplying said withdrawn sample in metered amounts via a feed tube to a reaction zone in a reaction chamber having at least one inlet and at least one outlet;

(c) automatically supplying an acid to said reaction zone in sufficient quantity so as to completely react with said sample to remove any metallic sodium therefrom and to generate hydrogen gas in proportion to the amount of sodium in said sample;

(d) separating the liquid and gaseous products from the reaction of said acid with said sample via a liquid-gas separator in fluid flow communication with said reaction chamber;

(e) selectively supplying an inert gas to said reaction chamber to force the gaseous reaction products from the reaction zone into the liquid-gas separator;

(f) automatically generating a signal in response to the amount of hydrogen gas generated per unit amount of said sample from the gaseous products separated in the liquid-gas separator via detector means to indicate the amount of hydrogen; and

(g) displaying said signal in units of sodium concentration in said amalgam stream.

4,326,851
LEVEL SENSOR APPARATUS AND METHOD

Ernesto Bello, Miami Springs; Steven N. Kolber, North Miami Beach, and Wallace H. Coulter, Miami Springs, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

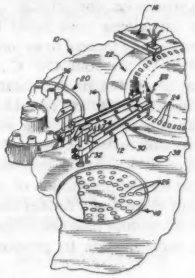
Filed Oct. 24, 1980, Ser. No. 200,142

Int. Cl.³ G01N *1/14, 35/06*

U.S. Cl. 23—230 R **36 Claims**

19. A method of sensing the level of a sample fluid in a fluid transfer mechanism transferring aliquots of electrically conductive sample fluids from a supply to reaction vessels, the mechanism including an arm, a shaft having an axis aligned vertically and being coupled to one end of the arm, vertical drive means for moving the arm up and down along the shaft axis, horizontal drive means for rotating the arm in an arcuate path around the shaft axis and fluid probe means depending from the other end of the arm for aspirating the aliquot from the sample supply and dispensing the aspirated aliquot in the reaction vessel, the method comprising:

forming a supply tray of a dielectric material, to include individual supply cavities which contain the fluid samples, the tray being rotatable to align an individual cavity with the arcuate path and when so aligned the individual supply cavity adopted to receive the probe means during the aspiration of the aliquot;



forming a capacitor of the sample fluid, the dielectric material and an electrode by biasing the electrode against the supply tray in a position under said individual supply cavity;

applying an AC signal to the electrode relative to a signal ground;

sensing modulation of the AC signal applied to the electrode and providing a level sense signal when the modulation is sensed;

connecting the probe means to the signal ground; and

modulating the AC signal applied to the electrode by engaging the fluid sample in the cavity with the probe means capacitively to ground the AC signal applied to the electrode through said capacitor and grounded probe means.

4,326,852
METHOD FOR INCREASING THE BULK WEIGHT OF SILICON DIOXIDE

Günter Kratel, Durach-Bechen; Gerhard Dummer, Burgkirchen; Peter Niessner, Sulzberg; Burkhard Grune, Burghausen, and Gunter Stohr, Durach-Bechen, all of Germany, assignors to Wacker-Chemie GmbH, Fed. Rep. of Germany

Filed Oct. 11, 1979, Ser. No. 83,718

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1978, 2844459

Int. Cl.³ B01D *29/20, 37/00, 46/26;* **B01J** *3/00*

U.S. Cl. 23—293 R **4 Claims**

1. A method for increasing the bulk weight of silicon dioxide having a bulk weight of 10 to 30 g/l and a surface area of at least 50 m^2/g by means of employing a sub-atmosperic pressure at a filter face, comprising the steps of:

feeding silicon dioxide whose bulk weight is to be increased to a filter face in a mechanically-pressureless manner by means of a rotating conveying screw, the longitudinal axis of which is disposed parallel to said filter face and which has a decreasing thread pitch in feeding direction, said silicon dioxide being fed at a rate of 200 to 350 kg per hour and per m^2 of filter face; and

subjecting said silicon dioxide to a pressure of 300 to 900 mbar, absolute, so as to draw off any gases contained therein, whereby the bulk weight of the silicon dioxide is increased to between 80 and 120 g/l.

4,326,853

COKE PRODUCTION FROM LIQUID DERIVED FROM SUB-BITUMINOUS AND/OR LIGNITIC COAL

Morgan C. Sze, Upper Montclair, and Andre A. Simone, Denville, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Continuation-in-part of Ser. No. 942,025, Sep. 13, 1978, abandoned. This application Mar. 21, 1980, Ser. No. 131,933

Int. Cl.[3] C10L 9/00

U.S. Cl. 44—1 F 17 Claims

1. In a process for the liquefaction of a coal selected from the group consisting of sub-bituminous and lignitic coals, wherein there is recovered an ash free coal liquid and an ash-containing coal liquid, the improvement comprising:

passing the ash containing coal liquid through a coking heater to effect heating thereof to an outlet temperature of from about 410° C. to about 450° C., and adiabatically effecting delayed coking of said heated ash-containing coal liquid at a pressure of from about 15 psig to about 120 psig, to produce an ash-containing soft coke having a combustible volatile matter content of from above 16 to no greater than 30 weight percent suitable as blending stock with coal for the production of metallurgical coke.

11. The process of claim 1 and further comprising blending the soft coke with bituminous coal and subjecting the blend to high temperature carbonization to produce a metallurgical coke.

16. A soft coke having a combustible volatile matter content of from above 16 to no greater than 30 percent by weight and an ash content of from 6 to 20 percent by weight, on a dry basis, produced by the process of claim 1.

4,326,854

SYNTHETIC FIRELOG

John D. Tanner, 1362 Tremblay St., Oshawa, Ontario, Canada

Continuation of Ser. No. 19,271, Mar. 9, 1979, abandoned. This application Jul. 28, 1980, Ser. No. 172,990

Int. Cl.[3] C10L 5/14, 5/00

U.S. Cl. 44—10 B 5 Claims

1. A synthetic firelog comprises an extruded mass of a material sufficiently solid to hold its shape at normal room temperatures, and carbonizable on combustion to provide a porous skeleton which will substantially maintain the configuration of the log, the material consisting essentially of 25% to 70% of particulate solid combustible material, the balance being a combustible solid binder, the binder comprising a major proportion of a normally liquid combustible byproduct modified by the presence of fatty acid salts in a quantity sufficient to solidify the binder, the combustibility of the extruded mass being such as to provide a safe but aesthetically acceptable rate of burning under fire-grate conditions from the time the log is fully alight until substantial consumption of the volatilizable content of the log.

3. A synthetic firelog comprising an extruded mass of a material sufficiently solid to hold its shape at normal room temperatures, and carbonizable on combustion to provide a porous skeleton which will substantially maintain the configuration of the log, the material comprising a mixture of particles of solid combustible material and a combustible solid binder, the binder forming at least 30% by weight of the log and comprising at least about 25% by weight of the binder of molasses, together with sufficient water-absorbent cellulosic material to solidify the molasses.

4,326,855

PROCESS FOR BENEFICIATING AND STABILIZING COAL/OIL/WATER FUELS

Eric C. Cottell, Private Rd., Bayville, N.Y. 11709

PCT No. PCT/US79/00988, § 371 Date Nov. 8, 1979, § 102(e) Date Nov. 8, 1979

PCT Filed Nov. 8, 1979, Ser. No. 118,032

Int. Cl.[3] C10L 1/31

U.S. Cl. 44—51/ 4 Claims

1. The process for producing fuel comprising making a slurry of coal particulate and water, sonifying the slurry with sufficient intensity to cause cavitation, adding oil to the sonified slurry to thereby cause spherical agglomeration of the oil and coal portions of the mixture, sonifying the slurry and oil mixture to enhance the spherical agglomeration process, screening out the water and any nonagglomerated particles from the coal particulate and adding oil to the agglomerate mass to form a stable fuel.

2. The process of claim 1 in which the agglomerate mass and oil mixture is sonified.

4,326,856

PRODUCTION OF CLEANED AND COOLED SYNTHESIS GAS

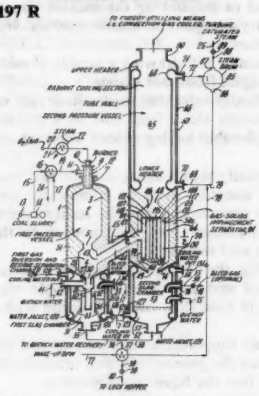
James R. Muenger, Beacon; Edward T. Child, Tarrytown, and Albert Brent, Huntington, all of N.Y., assignors to Texaco Development Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 43,918, Mar. 30, 1979, Pat. No. 4,251,228. This application Jul. 28, 1980, Ser. No. 172,747

The portion of the term of this patent subsequent to Feb. 17, 1998, has been disclaimed.

Int. Cl.[3] C10K 1/02

U.S. Cl. 48—197 R 26 Claims



1. A process for separating entrained solid matter and slag from a hot raw gas stream comprising H_2, CO, CO_2, entrained solid matter and slag, and one or more materials from the group H_2O, H_2S, COS, CH_4, NH_3, N_2, and A as produced in the reaction zone of a gas generator by the partial oxidation of solid carbonaceous fuel at a temperature in the range of about 1800° to 3000° F. and a pressure in the range of 10 to 190 atmospheres, and cooling said hot raw gas stream comprising:

(1) passing said hot raw gas stream directly from said reaction zone downward through a connecting passage at high velocity into a thermally insulated unobstructed free-flow gas diversion and residue separation chamber where the velocity of the gas stream is reduced, said residue separation chamber having a net internal volume which is smaller than that of said reaction zone and having bottom and side outlets, separating by gravity a portion of said solid matter and slag from the gas stream without substantially reducing the temperature of the gas stream, and passing said portion of separated material by gravity through said bottom outlet into a first slag pot located

directly below said first gas diversion and residue separation chamber;

(2) passing about 80.0 to 100 vol. % of the hot gas stream from said first-gas diversion and residue separation chamber with a portion of said solid matter and slag removed through said side outlet then through a thermally insulated transfer line and then through at least one thermally insulated gas-solids impingement separation means located in a separate vertical pressure vessel from that containing said gas diversion and residue separation chamber, said gas-solids impingement separation means having inlet and outlet means for the hot gas stream and outlet means for the solid matter and slag separated therein, separating additional solid matter and slag from the gas stream by said gas-solids impingement means without substantially reducing the temperature of the gas stream, and passing said separated portion of material into a second slag pot located directly below the gas-solids impingement means;

(3) passing about 80.0 to 100 vol. % of the hot gas stream with a portion of said solid matter and slag removed by said gas-solids impingement separation means directly into the bottom of and upward at a reduced velocity through the unobstructed central vertical passage of a radiant cooling zone having a plurality of vertical tubes lining the inside walls, simultaneously cooling said upflowing hot gas stream to below the maximum safe operating temperature for a downstream energy utilizing means by indirect heat exchange with a coolant flowing in said vertical tubes and solidifying at least partially any remaining ash particles in the gas stream, and removing additional solid matter and slag from said gas stream by gravity, and passing said separated portion of material into said second slag pot; and

(4) removing a cleaned gas stream from said radiant cooling zone at a reduced temperature.

4,326,857

PRODUCTION OF A GAS OF A HIGH HEATING VALUE FROM COAL

Tsutomu Kato, Kawaguchi, and Mamoru Kaiho, Toride, both of Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

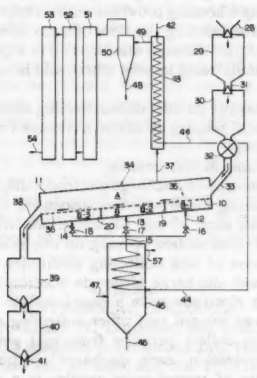
PCT No. PCT/JP79/00153, § 371 Date Feb. 15, 1980, § 102(e) Date Feb. 15, 1980, PCT Pub. No. WO80/00085, PCT Pub. Date Jan. 24, 1980

PCT Filed Jun. 15, 1979, Ser. No. 192,509

Claims priority, application Japan, Jun. 15, 1978, 53/72433

Int. Cl.³ C10J *3/00*

U.S. Cl. 48—210 **15 Claims**



1. A continuous process for hydrogenolytic gasification of coal to produce a combustible gas product comprising:

introducing powdery coal into a reaction chamber comprising an inclined gas dispersing plate and forming a layer of said powdery coal on said dispersing plate; said coal layer moving through said reaction chamber on said plate in the down grade direction of said plate;

introducing a gas consisting essentially of hydrogen through said dispersing plate into said coal layer; the amount of hydrogen gas introduced being not greater than 1 m^3 per Kg/coal;

reacting said powdery coal with said hydrogen gas at a temperature of 400° C. to 900° C. and a pressure of 20 Kg/cm^2 to 100 Kg/cm^2;

withdrawing coal residue from said reaction chamber, and

withdrawing a combustible gas product having a heating value of 6000 $Kcal/m^3$ to 9900 $Kcal/m^3$ from said reaction chamber.

4,326,858

PRESSURE BUILDUP TECHNIQUE IN PRESSURE SWING ADSORPTION PROCESS

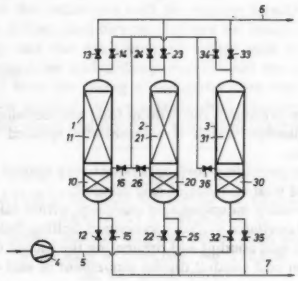
Christian Benkmann, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed May 31, 1978, Ser. No. 911,556

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1977, 2724763

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—26 **11 Claims**



1. In a pressure swing adsorption process for the separation of gases comprising the steps of passing crude gas under a superatmospheric adsorption pressure through a drying bed of H_2O-selective adsorbent to remove gaseous H_2O and then passing resultant H_2O-free gas sequentially through a separate and distinct zeolite-containing adsorbent bed for the removal of low-boiling impurities and the further steps of pressure release, desorption and pressure buildup to adsorption pressure, the improvement in the pressure buildup step which comprises introducing an H_2O-depleted gas obtained during said process to a point intermediate the drying bed and said zeolite-containing adsorbent bed and passing said H_2O-depleted gas into the drying bed in a countercurrent direction to the flow of crude gas and into the zeolite-containing adsorbent bed in a cocurrent direction to the flow of crude gas, and continuing said passing of said H_2O-depleted gas until the pressure buildup is at least 20% of the adsorption pressure.

4,326,859

DEGASSING OF DRILLING FLUIDS

Gerald E. Burnham, Sr., 401 N. Coreil St., Ville Platte, La. 70586

Filed Apr. 25, 1980, Ser. No. 143,536

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—52 **15 Claims**

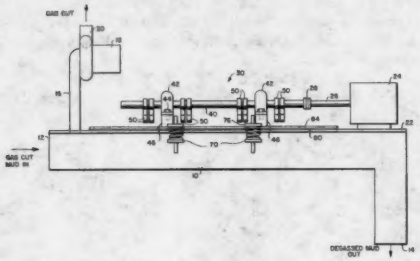
1. A method for removing entrained well gas from drilling fluid comprising the steps of:

conducting drilling fluid between opposed wall surfaces of a degassing chamber in a substantially closed degassing system isolated from the ambient in which a movable cavitator is disposed within the drilling fluid flow intermediate said opposed wall surfaces with the cavitator surfaces contacting said drilling fluid; and

imparting elliptically oscillating movements to said cavitator from outside of said degassing chamber through the wall thereof while at the same time preventing the escape of gas therefrom to alternately compress and rarefy said drilling fluid between said wall surfaces and said cavitator surfaces and thereby promote coalescence of small entrained gas bubbles into larger bubbles which may rise to the drilling fluid surface for removal.

2. Apparatus for removing entrained well gas from drilling fluid comprising:

a conduit having inlet and outlet means for flow of drilling fluid therethrough, said conduit providing opposed wall



surfaces to contact the drilling fluid and defining a degassing chamber which is substantially isolated from the ambient;

a cavitator providing surfaces respectively spaced from said opposed wall surfaces of said conduit;

means movably mounting said cavitator within said conduit for said cavitator surfaces to contact drilling fluid flowing through said conduit and preventing the escape of fluid or gas from said conduit during movement of said cavitator; and

drive means mounted externally of said conduit and drivingly connected to said cavitator, said drive means being operable to generate forces imparting elliptically oscillating movements to said cavitator whereby drilling fluid flowing through said conduit is alternately compressed and rarefied between said conduit wall surfaces and said cavitator surfaces to promote coalescence of small entrained gas bubbles into larger bubbles which may rise to the fluid surface for removal.

4,326,860

RIPPLE INSENSITIVE ELECTRIC PRECIPITATORS

Thomas C. Laugesen, Silverton, N.J., assignor to NWL Transformers, Bordentown, N.J.

Filed Nov. 28, 1980, Ser. No. 211,335
Int. Cl.³ B03C 3/68
U.S. Cl. 55—105 **8 Claims**

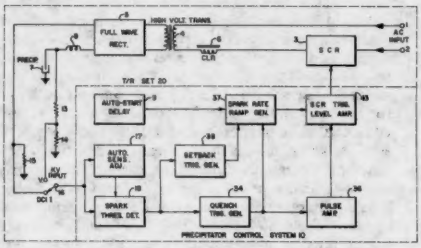
1. A control system for automatically controlling a substantially maximum voltage across a precipitator while maintaining a desired spark rate across the electrodes of the precipitator comprising

means for producing an attenuated precipitator signal proportional to the signal directly applied to the precipitator including ripple and spark components,

spark threshold means for detecting when the attenuated precipitator signal exceeds a predetermined threshold thereby to produce a threshold crossing signal,

control means responsive to said threshold crossing signal for providing a ramp signal for varying the voltage applied to the precipitator as a function of the desired spark rate,

sensitivity adjust means for producing a compensating signal proportional to the magnitude of the ripple component in the attenuated precipitator signal, and



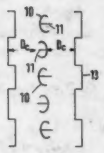
said spark threshold means including means for adjusting the DC level of the attenuated precipitator signal in accordance with the compensating signal so that the spark threshold means is insensitive to variations in the ripple component.

4,326,861

DUST-COLLECTING ASSEMBLY FOR ELECTROSTATIC PRECIPITATOR

Yoichi Matsumoto, Kobe, Japan, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 9, 1978, Ser. No. 884,805
Claims priority, application Japan, Apr. 28, 1977, 52-48549
Int. Cl.³ B03C 3/41, 3/76
U.S. Cl. 55—112 **1 Claim**



1. A dust-arresting assembly for use in an electrostatic precipitator having a housing provided with an inlet and an outlet and a blower for inducing the flow of a gas stream entraining high-resistance dust through said housing in a gas-flow direction, said assembly being located within said housing and comprising:

a pair of mutually parallel dust-collecting electrodes spaced apart in said housing to define a passage for said gas between them;

a support frame in said housing;

an array of elongated discharge electrodes disposed between said collecting electrodes and suspended from said support frame, each of said discharge electrodes having a C-shaped cross section opening on one side thereof confronting one of said collecting electrodes, the opposite side of each discharge electrode confronting the other collecting electrode with a broad-surface field-forming part convex toward said other collecting electrode and adapted to collect particles from said gas charged by reverse ionization, each discharge electrode having a multiplicity of spaced-apart needles in a row reaching from the bottom of the respective C and extending out of the C toward the respective said one of said collecting electrodes to form corona-producing means, the succes-

sive discharge electrodes along the path of the gas between said collecting electrodes being of alternating orientation with their corona-producing means facing alternately in opposite directions, cross sections through said discharge electrodes in planes perpendicular to their longitudinal dimensions being elongated in the direction of gas flow;

a high-voltage direct current source having its positive terminal connected to said collecting electrodes and its negative terminal connected to said discharge electrodes whereby said broad surfaces collect particles charged by reverse ionization; and

rapping means for rapping said collecting electrodes and for rapping said discharge electrodes for the dislodgement of dust therefrom.

4,326,862

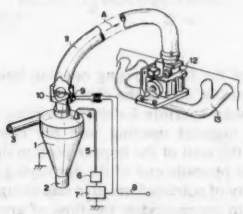
AIR CLEANER FOR ENGINES, HAVING BACK FLOW GAS SHUT-OFF FUNCTION

Nagatoshi Suzuki, 5-7-7, Kugahara, Ohta-ku, Tokyo, Japan

Filed Jun. 10, 1980, Ser. No. 158,129

Int. Cl.³ B03C *3/14*

U.S. Cl. 55—127 **5 Claims**



1. In an air cleaner for engines having a cyclone dust collector provided with an air intake and incorporating an electrostatic filter, an air induction pipe connecting said cyclone dust collector to the engine, and a high voltage generator connected to the electrostatic filter for applying high voltage to the electrostatic filter, the improvement comprising the air cleaner including a back flow gas check valve provided within said induction pipe and a switch connected to the high voltage generator and positioned and arranged with respect to the valve such that the switch is activated by the closing of said valve to stop the operation of said high voltage generator.

4. In an air cleaner for engines having a cyclone dust collector provided with an air intake and incorporating an electrostatic filter, an air induction pipe for connecting said cyclone dust collector to the engine and a high voltage generator connected to the electrostatic filter for applying high voltage to the electrostatic filter, the improvement comprising a valve seat located within the induction pipe and defining an aperture, a valve element positioned and arranged for opening and closing the aperture of said valve seat to prevent the flow of back flow gas, and a switch connected to the high voltage generator and positioned and arranged with respect to the valve such that the switch is operated by the closing of the aperture by said valve element to shut off the high voltage generator.

4,326,863

CENTRIFUGAL DEGASSER

Roger W. Day; Sidney W. Dunavent, and Elvis Rich, all of Houston, Tex., assignors to Geosource Inc., Houston, Tex.

Filed Jul. 21, 1980, Ser. No. 170,714

Int. Cl.³ B01D *19/00*

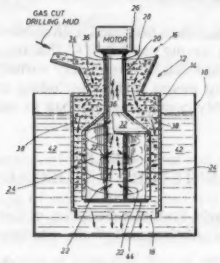
U.S. Cl. 55—171 **13 Claims**

1. A centrifugal degasser for use in degassing gas-cut drilling mud comprising:

a casing having an inlet port for receiving said gas-cut drilling mud and an outlet port for discharging degassed drilling mud;

a rotatable shaft disposed longitudinally within said casing, said rotatable shaft directly communicating with said inlet port to provide an exit for entrained gas within said gas-cut drilling mud;

a plurality of accelerating paddles disposed along the longitudinal axis of said rotatable shaft and attached thereto for moving said drilling mud in a rotary motion, thereby



creating a centrifugal force field and a vortex within said drilling mud such that the drilling mud moves axially toward the outlet port with the heavier liquid/solid phase of the drilling mud directed toward the inside wall of said casing, and the gas dispersed within said drilling mud escaping from said drilling mud toward the shaft to discharge from the casing at the outlet port; and

means for driving said rotatable shaft connected to said rotatable shaft and operably associated therewith.

4,326,864

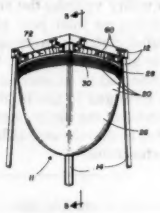
APPARATUS FOR AND METHOD OF COLLECTING SAWDUST PARTICLES

Werner G. Sittler, 4051 E. Calypso, Mesa, Ariz. 85206

Filed Aug. 8, 1980, Ser. No. 176,506

Int. Cl.³ B01D *46/02*

U.S. Cl. 55—364 **2 Claims**



1. A sawdust catcher, comprising:

collecting means having a bag provided with an inlet port and an outlet port for collecting sawdust from a table saw;

coupling means for attaching said bag to said table saw;

said collecting means further comprising mesh means having a peripheral coupling to said outlet port for trapping sawdust particles within said bag and further for exhausting air;

said mesh means comprising a foraminate screen;

said bag including a bottom portion;

said bag further provided with an upper portion having said inlet port at an uppermost portion thereof and having said outlet port positioned between said bottom portion and said inlet port so that sawdust can collect on an interior of said bottom portion and air can escape through said outlet port;

said screen having communication with said upper portion and further having communication with said lower portion;

said collecting means further comprising a frame having a plurality of frame rails;

said collecting means including adjusting means having communication with said frame for permitting an adjustment of the length of each of said frame rails;

said collecting means having a plurality of clamps disposed to clamp to a lower portion of said table saw and individually having a coupling to one of said plurality of frame rails;

said collecting means provided with at least an upper portion of said bag having resiliency so that the circumference of said inlet port can be stretchably varied; and

said collecting means further including connecting means for releasably connecting said bag to said frame.

4,326,865

AIR INTAKE UNIT FOR AN INTERNAL COMBUSTION ENGINE

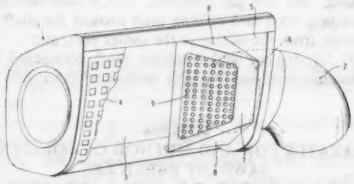
Karl-Heinz Siebels, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 19, 1980, Ser. No. 188,674

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 2938454

Int. Cl.³ B01D *59/50*

U.S. Cl. 55—385 B **8 Claims**



1. An air intake unit for an internal combustion engine, the air intake unit being adapted to be installed in an area of a driver's cab of a utility vehicle, the air intake unit comprising an intake box having an inlet port along a longitudinal side thereof, a perforated plate for covering the inlet port, an outlet port connected to an intake conduit, the intake conduit being adapted to be connected to an internal combustion engine, and air baffle means arranged in the intake box in an area of the outlet port for shielding the outlet port with respect to the inlet port, characterized in that the air baffle means is provided with a plurality of perforations.

4,326,866

DISCHARGE APPARATUS FOR REMOVING GRANULAR FILTER MATERIAL FROM A FILTER HOUSING AND A FILTER APPARATUS HAVING SAME

Alan Revell, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Dec. 26, 1979, Ser. No. 106,750

Int. Cl.³ B01D *46/30*

U.S. Cl. 55—479 **7 Claims**

1. A filter apparatus comprising:

(a) filter housing including

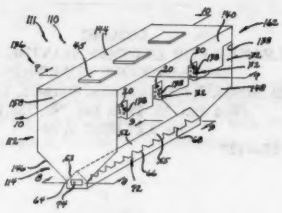
(1) a gas treating enclosure portion having dirty gas inlet means and clean gas outlet means; and

(2) a hopper portion disposed below and open to the gas treating portion having at least two facing walls sloping downwardly toward each other;

(b) means defining a plurality of filter cells containing a granulated gas filtering material, each of said filter cells being disposed within the gas treating enclosure portion of the filter housing between the dirty gas inlet means and the clean gas outlet means and being open to the hopper portion of the filter housing so that granulated gas filtering material will fall into the hopper portion of the filter housing;

(c) an elongated baffle plate spaced above the juncture of the sloping walls of the hopper portion to define a gas filtering material conveying channel for a conveying gas stream adapted to draw granulated filtering material from the interior of the hopper portion and carry it from the filter housing during filter cleaning operations, said conveying channel being within and extending completely across the hopper portion proximate the bottom of the filter housing;

(d) a conveying gas inlet aperture in one wall of the hopper



portion of the filter housing opening into the conveying channel at one end of the channel;

(e) a gas outlet aperture for the conveying gas and the gas filtering material opening into the conveying channel through the wall of the hopper portion of the filter housing at the opposite end of the conveying channel;

(f) a plurality of notches formed in said elongated baffle plate adapted to accommodate the flow of granulated filtering material from the interior of the hopper portion into the conveying channel; and

(g) a predetermined number of said notches being spaced apart along the length of the conveying channel at progressively increasing intervals starting proximate the gas inlet aperture to minimize cavitation in the granulated filtering material during filter cleaning operations.

4,326,867

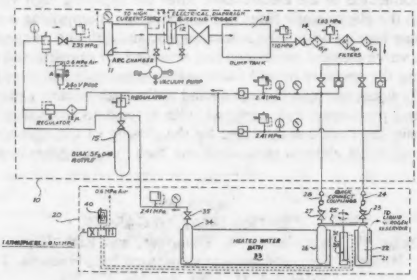
GAS RECOVERY

Anthony D. Stokes, 116 Lucinda Ave., Wahroonga NSW 2076, Australia

Division of Ser. No. 25,322, Mar. 28, 1979, Pat. No. 4,274,851. This application Mar. 30, 1981, Ser. No. 248,842

Int. Cl.³ F25J *1/02*; H01H *33/82*

U.S. Cl. 62—10 **6 Claims**



1. A method of alternatively evacuating and replacing sulphur hexafluoride gas from and to the switching chamber of a high voltage circuit breaker comprising:

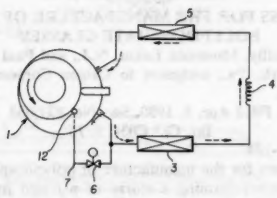
cryogenically reducing the temperature of a receiving vessel

below the phase transition temperature of sulphur hexafluoride gas,
fluidly connecting the receiving vessel to the switching chamber so that the sulphur hexafluoride gas flows quickly into the receiving vessel where it liquifies and solidifies,
closing off the receiving vessel from the switching chamber to contain the sulphur hexafluoride within the receiving chamber,
fluidly reconnecting the receiving vessel to the switching chamber,
heating the receiving vessel to cause the sulphur hexafluoride to vaporize and flow into the switching chamber, and
disconnecting the receiving vessel from the switching chamber.

4,326,868
REFRIGERATION SYSTEM UTILIZING A GASEOUS REFRIGERANT BYPASS

Masao Ozu, Fuji; Keiichi Morita, Fujinomiya, and Hiroshi Itoh, Fuji, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 18, 1979, Ser. No. 104,729
Claims priority, application Japan, Dec. 20, 1978, 53/156306
Int. Cl.³ F25B *13/00, 5/00*
U.S. Cl. 62—324.6 **18 Claims**



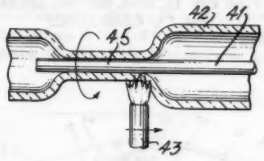
1. A refrigeration system of the type including a compressor, a condenser, an expansion device, an evaporator and interconnection means connected to form a refrigerant flow path therethrough wherein said system further comprises a gaseous refrigerant bypass between a high pressure zone of said system and said compressor through which a portion of the refrigerant from said high pressure gaseous refrigerant zone in said system, said zone including said condenser, is to be injected into said compressor, wherein said gaseous refrigerant bypass has one end connected to the compression chamber of said compressor and the second end in communication with the high pressure gaseous refrigerant zone including said condenser, and a portion of high pressure gaseous refrigerant from the second end is to be injected into said compression chamber of said compressor through said second end.

4,326,869
METHOD OF PRODUCING OPTICAL WAVEGUIDE

Shiro Kurosaki; Minoru Watanabe, and Yuichi Usui, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 28, 1979, Ser. No. 80,159
Claims priority, application Japan, Sep. 28, 1978, 53-120176
Int. Cl.³ C03C *25/02*
U.S. Cl. 65—3.14 **5 Claims**

1. A method of producing an optical waveguide by melt-drawing a glass preform composite comprising a transparent glass rod having a core portion and a cladding portion and a high refractive index glass jacket for said transparent rod, which comprises the steps of (a) depositing a dopant material for raising the refractive index of glass on the internal surfaces of the pores of a porous glass rod; (b) forming a radial dopant concentration gradient decreasing from the central to the peripheral portions of said porous glass; (c) collapsing the doped rod by the application of heat to form said transparent glass rod having a core portion exhibiting a high index of refraction and an outer cladding exhibiting a low index of refraction; (d) providing said high index of refraction, circumferential jacket layer for said transparent rod of a glass matched to have a viscosity and coefficient of expansion at melt-drawing temperatures substantially similar to the viscos-

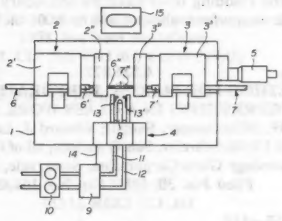


ity of said core portion of said transparent rod and the index of refraction being higher than the cladding portion by inserting said rod into a pipe of said matched glass; (e) collapsing said pipe around said transparent rod by the application of heat to form said preform composite; and (f) melt-drawing and heat-treating said composite to form said optical waveguide having a smooth outer surface, moisture resistance and improved mechanical strength.

4,326,870
PROCESS AND DEVICE FOR FUSION JOINING OF FIBER-OPTICS FIBERS

Jean-Pierre Bendit, Vieilles Geuches, Courgenay, Switzerland (2892); Jean-Paul Pellaux, Petits Chenes 2, Neuchatel, Switzerland (2000), and Georges Widmer, Berghausweg 21, Bienne, Switzerland (2501)

Filed Sep. 15, 1980, Ser. No. 186,964
Claims priority, application Switzerland, Sep. 14, 1979, 8329/79
Int. Cl.³ C03B *23/20*
U.S. Cl. 65—4.21 **5 Claims**



1. Process for fusion joining of the ends of optical fibers to produce an optical junction between two aligned fibers each of which fibers comprises a glass core and a glass sheathing; characterized in that the ends of the two fiber cores to be joined are disposed facing each other, with their faces cut transversely, in an approximately aligned position but such that at least one of the ends is free to be displaced laterally and there is no axial force between the two ends; and in that the ends of the fibers are heated in order to form a fused joint by producing a heat field with a predetermined distribution; for a predetermined period until attenuation of light transmitted through the fused joint increases, so as to cause partial fusion of the cores while maintaining the sheathing of the fibers intact, whereby the ends of the fibers are automatically aligned under the action of the surface tension which arises in consequence of said fusion, and whereby the fused joint is produced automatically by solidification, at the instant when alignment is achieved, whereby the material which solidifies here is fused

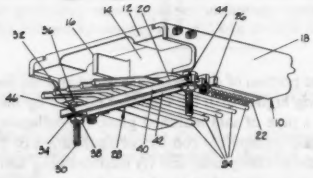
material which has penetrated by capillary action into the space between the cores of the fibers which are to be joined.

4,326,871

COOLING TUBES FOR GLASS FILAMENT PRODUCTION APPARATUS

Walter W. Harris, Toledo, Ohio, assignor to Manville Service Corporation, Denver, Colo.

Filed Feb. 11, 1980, Ser. No. 120,022
Int. Cl.³ C03B *37/025*
U.S. Cl. 65—12 **4 Claims**



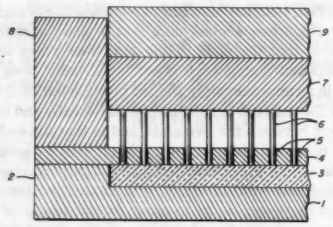
1. In an apparatus for forming glass filaments comprising the combination of: a chamber for the containment of molten glass, said chamber having a base, a plurality of small orifices in said base for discharging fine streams of molten glass from said chamber for attenuation into filaments; a plurality of cooling means positioned beneath and in proximity to said base, said cooling means being arranged to extend intermediate said orifices to cool glass filaments being drawn from said chamber, wherein said cooling means are each formed as a hollow tube from a base metal clad with a layer of noble metal; said base metal being selected from the group consisting of nickel, inconel, molybdenum, copper, alloys of these materials, and refractory metals, said hollow cooling tube having a wall thickness within the range of 0.010 to 0.030 inches; said noble metal being selected from the group consisting of platinum, palladium, rhodium, iridium, gold, silver, and their alloys, said noble metal cladding layer having a secondary wall thickness within the range from about 0.004 to 0.008 inches.

4,326,872

METHOD FOR MAKING PERFORATIONS OR DEPRESSIONS IN A GLASS WORK PIECE

Charles W. Miltenberger, Saugus; Edward J. Lucas, Simi Valley, and Ulrich Schreier, San Francisco, all of Calif., assignors to Technology Glass Corporation, Sunnyvale, Calif.

Filed Jun. 30, 1980, Ser. No. 164,699
Int. Cl.³ C03B *23/26*
U.S. Cl. 65—112 **8 Claims**



1. The method of opening holes or forming depressions in a glass workpiece which comprises:

(1) providing a two piece housing for said workpiece, said housing when assembled having a cavity conforming in size and shape to said workpiece, the lower housing piece having a continuous upper surface and the upper housing piece having a smooth surface and openings in said housing piece conforming in size and position to the holes or depressions desired to be made in said workpiece,

(2) placing said workpiece on the upper surface of the housing piece and covering the upper surface of workpiece with the upper housing piece so that the upper surface of said workpiece and the lower surface of the upper housing piece are in contact with each other,

(3) inserting in the openings in said upper housing piece plugs snugly fitting said openings and extending above the upper surface of said housing piece,

(4) disposing on the upper surface of said plugs a weight sufficient to cause said plugs to exert a pressure of at least 0.2 pounds per square inch on said workpiece,

(5) heating the assembly resulting from steps 1 to 4 to a temperature intermediate the softening point and the working point of the workpiece and maintaining such temperature until the plug's descent into the workpiece ceases and the glass displaced by the descent of the plugs flows into the body of the workpiece causing a slight thickening of the workpiece,

(6) cooling said assembly to ambient temperature, and

(7) removing the workpiece from the housing and removing the plugs from the workpiece.

4,326,873

PROCESS FOR THE MANUFACTURE OF FUSED POLYPHOSPHATE GLASSES

Phillip B. Reilly, Mountain Lakes, N.J., and Paul H. Ralston, Bethel Park, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Apr. 3, 1980, Ser. No. 137,053
Int. Cl.³ C03C *3/16*
U.S. Cl. 65—134 **5 Claims**

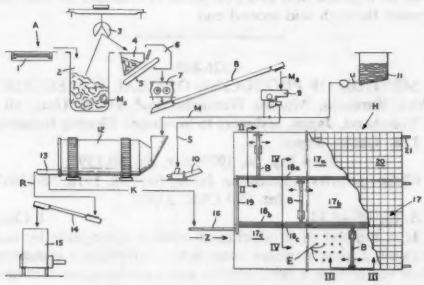
1. A process for the manufacture of polyphosphate glasses which comprises forming a slurry of a liquid hydrocarbon, soda ash, alone or in combination with a di-valent metal oxide, and a source of phosphoric acid; melting the reaction mixture; and quenching the product.

4,326,874

PROCESS AND APPARATUS FOR PREPARING COMPOSTABLE MATERIAL

Werner Bürklin, Sonnhaldenstr. 7, CH-8280 Kreuzlingen, Thurgau, Switzerland

Filed Mar. 12, 1979, Ser. No. 19,706
Int. Cl.³ C05F *7/00*
U.S. Cl. 71—9 **7 Claims**



1. A process for preparing compostable material on a storage surface with a displaceable loading bridge extending over the surface at a distance thereabove, and a delivery member arranged on said bridge in facing relation with said storage surface and connected to at least one conveyor means which

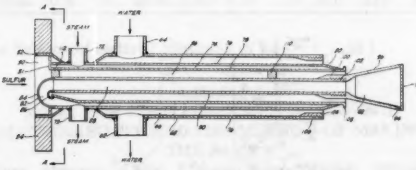
brings the material to said delivery member, said process comprising feeding the compost material as loose material to a compression station carried on the bridge, compressing the compost material at said compression station to form briquetts, the compost material being compressed in a press which is suspended from the bridge and is displaced above the storage surface in the course of forming said briquettes, depositing said briquettes on one another in adjacent, spaced vertical rows on said storage surface to directly stack said briquettes in said spaced rows on the storage surface, said compost material comprising defecation sludge of more than 80% moisture mixed with comminuted portions of garbage whereby the compost material gives off gases, the compressing of the compost material to form briquettes causing expressing of liquid, the process further comprising wetting the briquettes which have already been stacked with the expressed liquid and returning gases given off by the compost material at least in part to the material to effect aeration thereof.

4,326,875

SULFUR PRODUCT AND METHOD

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 972,729, Dec. 26, 1978, which is a continuation-in-part of Ser. No. 803,585, Jun. 6, 1977, abandoned. This application Dec. 26, 1979, Ser. No. 106,390
The portion of the term of this patent subsequent to Nov. 24, 1998, has been disclaimed.
Int. Cl.³ C05G *3/06*
U.S. Cl. 71—11 **6 Claims**



1. The method of supplementing the sulfur content of soil including the steps of applying to said soil at least about 20 pounds per acre of a homogeneous hydrocarbonsulfur fusion comprising a continuous rhombic sulfur matrix containing a hydrocarbon nonreactive with sulfur, said hydrocarbon being uniformly distributed throughout said continuous sulfur matrix, wherein said fusion contains at least about 60 weight percent rhombic sulfur and at least about 0.2 weight percent of said hydrocarbon based on the weight of said fusion.

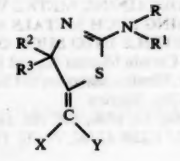
4,326,876

2-AMINOSUBSTITUTED-5-METHYLENE-THIAZOLE AND 3-AMINOSUBSTITUTED-1 METHYLENE-2,4-THIAZASPIRO[5.4]DECANE HERBICIDES

Edward I. Aoyagi, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 28, 1980, Ser. No. 115,593
Int. Cl.³ C07D *277/08*
U.S. Cl. 71—090 **7 Claims**

1. A compound of the formula



wherein X and Y are individually hydrogen or halogen;

R^2 and R^3 are individually alkyl of 1 to 3 carbon atoms or R^2 and R^3 are joined to form a cycloalkyl group of 3 to 8 carbon atoms;

R is hydrogen, alkyl of 1 to 4 carbon atoms or alkoxyalkyl of 2 to 20 carbon atoms; and

R^1 is alkyl of 1 to 20 carbon atoms, alkenyl or alkynyl of 3 to 20 carbon atoms, cycloalkyl or polycycloalkyl of 5 to 12 carbon atoms, alkoxyalkyl of 2 to 20 carbon atoms, cyanoalkyl or cyanoalkenyl of 3 to 20 carbon atoms; with the proviso that when R and R^1 are both alkyl groups as defined above, R and R^1 each contain at least 3 carbon atoms.

4,326,877

METHOD OF STIMULATING GRASS ROOT GROWTH WITH 6-BENZYLAMINOPURINE

Yahiro Kazutoyo, Chofu, Japan, assignor to Kabushiki Kaisha Kohjin, Tokyo, Japan

Filed May 30, 1980, Ser. No. 154,876
Claims priority, application Japan, Jun. 7, 1979, 54-70602
Int. Cl.³ A01N *43/50*
U.S. Cl. 71—92 **3 Claims**

1. A method for stimulating the growth of grass roots, said method comprising spraying solution consisting essentially of diluted 6-benzylaminopurine on the leaves and stems of grass.

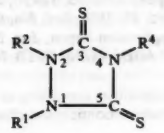
4,326,878

HERBICIDAL AND PLANT-GROWTH-REGULATING 1,2,4-TRISUBSTITUTED-1,2,4-TRIAZOLIDIN-3,5-DITHIONES

Stephen D. Ziman, San Francisco, Calif., assignor to Chevron Research, San Francisco, Calif.

Continuation-in-part of Ser. No. 10,669, Feb. 9, 1979, Pat. No. 4,276,420, which is a continuation-in-part of Ser. No. 909,140, May 24, 1978, abandoned. This application Jul. 25, 1979, Ser. No. 60,310
The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.
Int. Cl.³ A01N *43/64*; C07D *249/12*
U.S. Cl. 71—92 **8 Claims**

1. A compound of the formula



wherein R^1 is alkyl of 1 to 3 carbon atoms and R^2 is alkyl of 1 to 3 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkoxyalkyl of 2 to 6 carbon atoms and alkylthioalkyl of 2 to 6 carbon atoms, and R^4 is p-halophenyl wherein halo is fluoro, chloro, bromo or iodo.

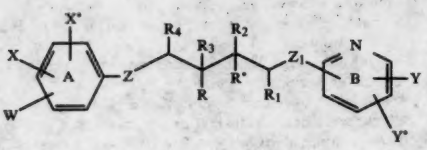
4,326,879

1-PHENOXY-4-PYRIDYLBUTANES AND DERIVATIVES

Homer K. Spencer, Randolph, and Melvin M. Graben, Hacketts-town, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Feb. 4, 1980, Ser. No. 118,538
Int. Cl.³ A01N *43/40*; C07D *213/64, 213/65*
U.S. Cl. 71—94 **15 Claims**

1. A compound of the formula:



wherein

W is CF_3 in the meta position of Ring A

each of X and X' are H,

Z and Z_1 are independently oxygen or sulfur, with the proviso that at least one is oxygen,

Y is H,

Y' is H, Cl or C_1–C_2 alkyl,

R_1, R_2 R_3 and R_4 are H.

6. The method of combatting weeds comprising applying to a weed locus a herbicidally effective amount of a compound of claim 1.

4,326,880

DERIVATIVES OF 5-(PYRIDYL-2-OXY)-2-NITROBENZOIC ACID, AND HERBICIDAL COMPOSITIONS CONTAINING THEM, AND HERBICIDAL METHODS FOR USING SAME

Hermann Rempfler, Ettingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 4, 1980, Ser. No. 174,985

Claims priority, application Switzerland, Aug. 14, 1979, 7430/79

Int. Cl.³ C07D *213/64;* A01N *43/40*

U.S. Cl. 71—94 **13 Claims**

1. 5-(3'-Chloro-5'-trifluoromethylpyridyl-2'-oxy)-2-nitrobenzoic acid allyl ester.

4,326,881

PHENYLPYROL DERIVATIVES

Akiyoshi Ueda, Hiratsuka; Hideo Takagi, Kanagawa, and Kazuhiko Ohkuma, Ninomiyamachi, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Filed Dec. 18, 1978, Ser. No. 970,153

Claims priority, application Japan, Jan. 31, 1978, 53-9752

Int. Cl.³ A01N *43/36;* C07D *207/323*

U.S. Cl. 71—95 **1 Claim**

1. A fungicidal composition consisting of an inert carrier and a fungicidally effective amount of 4-chloro-3-(2,3-dichlorophenyl)pyrrole.

4,326,882

TRICHLOROPHENOXY ALKANOIC ACID FREE OF CHLORINATED DIBENZO-P-DIOXINS

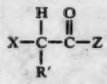
Sidney B. Richter, Akron, and William S. Grove, Doylestown, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 937,645, Aug. 28, 1978. This application Apr. 26, 1979, Ser. No. 33,349

Int. Cl.³ C07C *59/68;* A01N *39/02, 39/04*

U.S. Cl. 562—472 **8 Claims**

1. In a process for preparing 2,4,5-tri-chlorophenoxy alkanoic acid esters or amides by reacting in a liquid organic solvent and in the presence of an inorganic or organic base 2,5-dichlorophenol with at least an equimolar amount of alpha halo compound represented by the formula:



wherein

X is bromine, chlorine or iodine;

R' is hydrogen or methyl; and

Z is a hydrolyzable group selected from aliphatic radicals containing up to 20 carbon atoms or amide or mono- or di-substituted amide, the substituent containing up to about 20 carbon atoms, and chlorinating the reaction product in the liquid phase, the improvement wherein the reaction between 2,5-dichlorophenol and the alpha halo compound is conducted at a temperature of not more than 60° C. and in the presence of at least one mole but not more than a 5 percent molar excess of base per mole of 2,5-dichlorophenol, so as to obtain a pure product that is free of analytically detectable amounts of chlorinated dibenzo-p-dioxins.

4,326,883

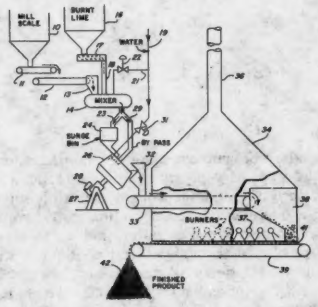
PROCESS FOR DEOILING AND AGGLOMERATING OIL-BEARING MILL SCALE

Arthur M. Schwarz, Munster, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Jul. 10, 1979, Ser. No. 56,331

Int. Cl.³ C21B *3/04;* C22B *7/02*

U.S. Cl. 75—5 **24 Claims**



1. A process for deoiling and agglomerating oil-bearing mill scale which comprises the steps of:

(a) blending and mechanically scouring oil-bearing mill scale with calcined lime fines to form a mix;

(b) balling the resultant mix to form green mill scale-lime pellets; and

(c) heating the green pellets in an oxidizing atmosphere to a temperature sufficient to effect ignition and substantially complete combustion of the oil in said pellets, whereby to form deoiled pellets suitable for use in a sinter mix without objectionable evolution of oil vapors during sintering.

4,326,884

PROCESS FOR OBTAINING METAL VALUES FROM ORES CONTAINING SUCH METALS AS OXIDES OR CONVERTIBLE INTO SUCH OXIDES

Vicente Soriano G.; Carmin Marino A., and Enrique R. Valdez, all of Mexico City, Mexico, assignors to Comision de Fomento Minero, Mexico City, Mexico

Filed May 13, 1980, Ser. No. 149,395

Int. Cl.³ C22B *13/02, 17/02, 19/04*

U.S. Cl. 75—71 **8 Claims**

1. A process for obtaining metal values from ores containing

volatilizable metals in the form of oxides or compounds convertible into oxides, which process comprises the steps of forming particles by grinding metal oxide-containing starting ores to a particle size in the range from 7 mm diameter maximum to 325 mesh minimum; isothermically reducing the metal oxides of the starting ore in a reactor in which said particles are formed into a fluidized bed at temperatures between 560° C. and 1,200° C. by a fluidizing gas comprising a reducing medium produced by controlled combustion of natural gas, thereby obtaining a gaseous mixture containing volatilized metals and gangue particles; condensing the metals to solidified form by direct contact with water; recovering the metals and the gangue from the resulting water by sedimentation and filtration; drying the metals and the gangue in a reducing atmosphere, and separating the metals from the gangue by vaporization of the metals.

4,326,885

PRECIPITATION HARDENING CHROMIUM STEEL CASTING ALLOY

John A. Larson, and Robert B. Fischer, both of Easton, Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jun. 16, 1980, Ser. No. 159,913
Int. Cl.³ C22C *38/16*
U.S. Cl. 75—125 **4 Claims**

1. A martensitic steel casting alloy consisting of the following anticipated range of chemistry:

	C	Mn	P	S	Si	Ni	Cr	Mo	Cu
% min.	0.01						11.5		1.0
% max.	0.08	1.00	0.040	0.040	1.50	1.00	14.0	0.50	4.5

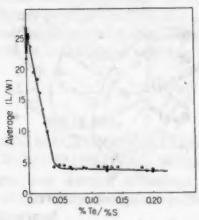
the balance of material consisting of iron.

4,326,886

STEEL FOR COLD FORGING HAVING GOOD MACHINABILITY AND THE METHOD OF MAKING THE SAME

Shozo Abeyama, Chita; Makoto Saito, Nagoya; Atsuyoshi Kimura, Handa, and Sadayuki Nakamura, Chita, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 14, 1980, Ser. No. 130,529
Claims priority, application Japan, Mar. 14, 1979, 54-28619
Int. Cl.³ C22C *38/60*
U.S. Cl. 75—129 **1 Claim**



1. A method of making a steel for cold forging having good machinability containing:
C up to 0.6%,
Si up to 0.5%,
Mn up to 2.0%,
S 0.003 to 0.04%, and
Te up to 0.03%,
wherein ratio %Te/%S being at least 0.04, and further,
Al 0.01 to 0.04%,
N up to 0.02% and
O up to 0.0030%,
and optionally, at least one of the alloying elements selected from the group of:
Ni up to 4.5%,
Cr up to 3.5%, and
Mo up to 1.0%,
at least one of the alloying elements selected from the group of:
V up to 2.0%,
Nb up to 0.5%,
Ti up to 0.5%,
B up to 0.01% and
Zr up to 0.5%,
and at least one of the alloying elements selected from the group of:
Pb 0.01 to 0.3%
Se 0.003 to 0.10%,
Bi 0.01 to 0.30% and
Ca 0.0002 to 0.01%,
and the balance being substantially Fe, which method comprises the steps of:
preparing a molten steel containing the predetermined amounts of C, Si, Mn and S in a furnace or a ladle,
at the time of refining by addition of Al to the molten steel during or after vacuum degassing, introducing non-oxidizing gas in the molten steel for forceable stirring so that large-sized particles of non-metallic inclusions may float up and separate,
and adding Te, and, if necessary, Pb, Bi or Ca to the molten steel to disperse the elements uniformly therein.

4,326,887

BASIC PROCESS OF PRODUCING BASIC FLUXED PELLETS FOR IRON-MAKING

John H. McAllister, Burlington; Lindsay G. Stewart, Hamilton; Carl V. Gladysz, Mount Hope, and Jim Wilson, Hamilton, all of Canada, assignors to Dofasco Inc., Hamilton, Canada

Continuation-in-part of Ser. No. 91,430, Nov. 5, 1979, abandoned. This application Dec. 3, 1980, Ser. No. 212,380
Int. Cl.³ C22B *9/10*
U.S. Cl. 75—257 **7 Claims**

1. A process for the production of a basic fluxed pellet for iron-making operations, the process including:
(A) grinding an iron-containing material to at most about 45 microns in size;
(B) grinding melt shop slag fines containing calcium and magnesium in the pre-calcined form of oxide thereof to at most about 45 microns in size;
(C) mixing together the said iron-containing material and from 1 to 20% by weight of the resultant pellet of the said melt shop slag fines to provide a mixed material in which:
(a) the silica content is from about 2.5% to about 7.0% by weight,
(b) the CaO/SiO_2 ratio is in the range 0.9 to 1.8,
(c) the MgO content is in the range of 1.0 to 2.5% by weight, and
(D) indurating the mixed material to form discrete self-sustaining pellets.

4,326,888

ANTI-RUST COMPOSITION

Jeremy G. M. Frew, 30 Montgomery St., Edinburgh, Scotland

Filed Oct. 1, 1979, Ser. No. 80,932
Claims priority, application United Kingdom, Jan. 13, 1977, 1250/77
Int. Cl.³ C09D *5/08*; C08L *25/04*
U.S. Cl. 106—14.14 **7 Claims**

1. A composition for application to the rusted surface of a ferrous metal article to inactivate the rust thereon and prevent further rusting, which consists essentially of an aqueous dispersion or emulsion of a water-insoluble film-forming material forming after drying a tough durable adherent coating upon said surface, and dissolved in the aqueous phase of said emulsion citric acid and a water-soluble metal chloride in sufficient proportions to react in situ with the rust to form a reaction

product therewith to inactivate the same and prevent further rusting, the reaction product of said citric acid and said chloride with the rust remaining within said coating of said film-forming material, the amount of said film-forming material being in the range of about 50–75%, the amount of said citric acid being in the range of about 20–30%, and the amount of said chloride being in the range of about 10–20%, all percentages being by weight on a dry basis of the mixture of said film-forming material, citric acid, and chloride.

4,326,889

DENTAL COMPOSITION FROM GOLD PARTICLES, TERPINEOL AND ETHYL CELLULOSE

Franz Sperner, Hanau am Main, Fed. Rep. of Germany, assignor to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Oct. 9, 1979, Ser. No. 82,673

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851729

Int. Cl.³ C08K *3/08, 5/05*

U.S. Cl. 106—35 **2 Claims**

1. A dental gold composition comprising:

(1) 75% to 95% by weight gold wherein at least 95% of said gold comprises essentially spherical particles having an average particle size of from between 0.8 to 1.2 μm and a maximum particles size of 2 μm and,

(2) the remainder of said composition comprising a paste-forming oil consisting essentially of terpineol and ethyl cellulose, the by weight percentages being based on the weight of the composition.

4,326,890

BEDDING ANCHORAGE RODS

Alain Benichou, Residence de la Gare 24, Pontailler, Saore, France

Filed Oct. 2, 1978, Ser. No. 926,921

Int. Cl.³ C04B *31/00*

U.S. Cl. 106—77 **23 Claims**

1. A composition for bedding anchorage rods in mine galleries comprising:

(a) about 6 to 25 parts by weight of plaster;

(b) about 20 to 44 parts by weight of at least one member selected from the group consisting of sand and silica powder; and

(c) about 25 to 30 parts by weight of a solution of sodium silicate, said solution having at least about 2 parts by weight SiO_2 to 1 part by weight Na_2O.

4,326,891

CRYSTALLINE CALCIUM CARBONATE AS A DILUENT IN HYDROTHERMALLY CURED HYDRAULIC CEMENT COMPOSITIONS

Thomas H. Sadler, Littleton, Colo., assignor to Manville Service Corporation, Denver, Colo.

Filed May 21, 1980, Ser. No. 151,856

Int. Cl.³ C04B *7/02*

U.S. Cl. 106—99 **10 Claims**

1. In a hydrothermally cured article of manufacture comprising a blend of calcium carbonate, inorganic reinforcing fiber, hydraulic cement and ground quartz, the improvement comprising said calcium carbonate being a powdered crystalline calcium carbonate having a well-defined, highly compacted, structurally sound, crystalline structure and having at most a minor amount of carbonates with an amorphous structure and wherein the average equivalent spherical diameter of the particles of the crystalline calcium carbonate is between about 10 and 50 microns.

4,326,892

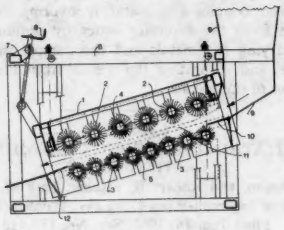
METHOD OF IMPROVING THE RECOVERY OF SUGAR FROM SUGAR BEETS BY EXTRACTION ON AND APPARATUS FOR CARRYING OUT SAID METHOD

Rud F. Madsen, and Werner K. Nielsen, both of Nakskov, Denmark, assignors to Aktieselskabet de Danske Sukkerfabrikker, Copenhagen, Denmark

Filed Dec. 11, 1979, Ser. No. 102,382

Int. Cl.³ C13D *1/08, 1/12*

U.S. Cl. 127—43 **7 Claims**



1. A method of increasing the amount of sugar recovered from sugar beets, said method comprising, in sequence, the following steps:

(a) washing the sugar beets to remove adhered impurities,

(b) mechanically removing at least a part of the outer layer of each of the washed sugar beets,

(c) slicing the sugar beets of step (b), and

(d) extracting the sliced sugar beets of step (c) with an aqueous solution to provide a sugar juice rich in sugar.

4,326,893

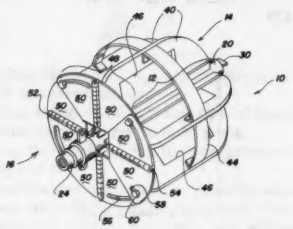
IMPLEMENT AND METHOD FOR CLEANING TUBULAR DRAINS

Jack R. Clifford, Alton, Ill., assignor to Paul L. Pratt, Bethalto and John T. Pierce, Jr., Edwarsville, both of, Ill., part interest to each

Continuation-in-part of Ser. No. 42,548, May 25, 1979, Pat. No. 4,218,803. This application Jul. 14, 1980, Ser. No. 168,727

Int. Cl.³ B08B *9/04*

U.S. Cl. 134—8 **9 Claims**



1. An implement for cleaning tubular drains, said implement comprising an elongated carriage assembly with means for cutting at its forward end and plunging means at its rearward end in spaced relationship with said cutting means, said cutting means comprising a plurality of blades radially extending from the carriage assembly, said plunging means comprising a plurality of fan shaped elements pivoted to said carriage assembly and folded backwardly into a cone when the implement is pulled forward and expanded into a plate when the implement is pulled backward, said fan shaped elements being connected as a unit whereby pressure on one or more of said fan shaped elements is transmitted to the other fan shaped elements so that said fan shaped elements close into a cone and expand into a

plate as a unit, said implement further including arcuate root cutting blades joining adjacent ones of the radially extending blades and water directing means for spraying water in front of the plunging means.

9. The method of claim 8 which further includes pumping the slurried waste from the tubular drain while said implement is towed backwards.

4,326,894

PROCESS FOR THE PRODUCTION OF CONVERSION LAYERS ON METAL SURFACES BY THE SPRAY METHOD

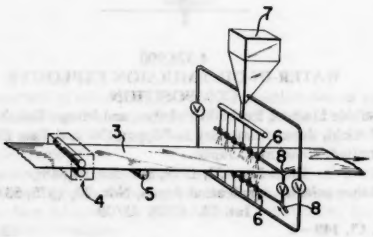
Wolfgang Konnert, Frechen, Fed. Rep. of Germany, assignor to Gerhard Collardin GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 150,189, May 15, 1980, abandoned. This application Jun. 11, 1981, Ser. No. 272,717

Claims priority, application Fed. Rep. of Germany, May 13, 1979, 2922115

Int. Cl.³ C23F 7/00, 7/26

U.S. Cl. 148—6.14 R **8 Claims**



1. In the process for the production of conversion layers continuously on a continuously moving band or sheet-like metal surfaces of aluminum, zinc or iron, by the application of a solution creating a layer on said metal surfaces selected from the group consisting of a chromating solution, an acid solution free of chromic acid and containing fluorides and compounds of titanium, zirconium or manganese, an acid solution free of chromic acid and containing fluorides, and an acid solution free of chromic acid and containing compounds of titanium, zirconium or manganese, by the stationary spray method, onto the cleaned and rinsed metal surface, and subjecting said metal surfaces to customary aftertreatments, the improvement consisting in that said solution in a sufficient amount at a sufficient concentration to deposit a uniform layer of from 0.01 to 1 gm/m^2 on said metal surfaces is sprayed through at least one two-component jet spray nozzle with the aid of an inert compressed gas where said solution and said compressed gas are fed separately each to an opening in said two-component jet spray nozzle.

4,326,895

PROCESS FOR MANUFACTURING ALUMINUM STRIP OR SHEET HAVING IMPROVED WELDABILITY

Werner Horn, Singen, and Jürgen Hennings, Gottmadingen, both of Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 18, 1980, Ser. No. 141,430

Claims priority, application Fed. Rep. of Germany, May 2, 1979, 2917627

Int. Cl.³ C22F 1/04

U.S. Cl. 148—11.5 A **12 Claims**

1. A process for manufacturing aluminum sheet or strip characterized by improved weldability comprising:

rolling said aluminum sheet or strip to an intermediate thickness of from about 1.5 to 2.5 times the final gauge;

etching said rolled sheet or strip in an alkaline solution; and

rolling said etched sheet or strip to final gauge.

6. A process according to claim 1 further including the steps of heat treating said aluminum sheet or strip after rolling to said final gauge.

4,326,896

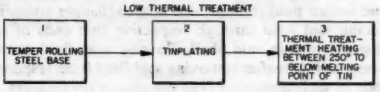
METHOD OF MAKING TIN-LAYERED STOCK MATERIAL AND CONTAINERS THEREFROM

Seung W. Lyu, Homewood, and Surya K. Misra, Naperville, both of Ill., assignors to National Can Corporation, Chicago, Ill.

Filed Sep. 15, 1980, Ser. No. 187,606

Int. Cl.³ C21D 9/46, 9/48

U.S. Cl. 148—12 D **11 Claims**



1. A method of producing a seamless container body from tinplate stock material comprising the steps of:

a. providing a steel base stock material;

b. providing a layer of tin on at least one side of said steel base;

c. heating said stock with said layer of tin thereon to an elevated temperature above approximately 250° F., but lower than a temperature which is high enough to cause melting of said tin layer, to form an iron-tin alloy layer on said steel base; and

d. forming a seamless container body from said stock material after said heating.

4,326,897

POST WELD HEAT TREATMENT OF SHELL AND TUBE HEAT EXCHANGERS AND APPARATUS

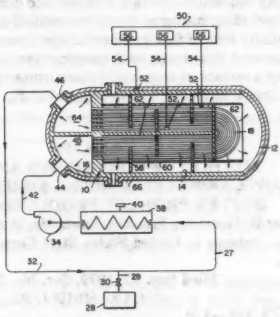
Anthony Ruhe, 1310 Pelham St., Box 791; John A. Chitty, 2 Peachtree Park, both of Fonthill, L0S 1E0, Ontario, and James H. D. Nickerson, 71 Cherie Rd., St. Catharines, L2R 6L6, Ontario, all of Canada

Filed Jun. 6, 1979, Ser. No. 46,122

Claims priority, application Canada, Apr. 26, 1979, 326458

Int. Cl.³ C22F 1/00; C21D 9/08, 11/00

U.S. Cl. 148—13.1 **20 Claims**



1. A method of heat treating a welded tubular type heat exchanger, said heat exchanger including a shell and a plurality of tubes disposed therein, said method comprising the steps of:

(a) establishing a fluid flow circuit for circulating a heating fluid from an external source through said heat exchanger;

(b) introducing a heating fluid to said circuit;

(c) applying heat to said fluid;

(d) circulating said heated fluid from said flow circuit through said heat exchanger;

(e) measuring the temperature of said heat exchanger at a plurality of points within said heat exchanger;

(f) increasing the amount of heat applied to said fluid so as to gradually raise the temperature of said fluid and said heat exchanger to a predetermined level;

(g) maintaining said increased temperature of said heating fluid and said heat exchanger at said predetermined level for a predetermined period of time; and

(h) decreasing the amount of heat applied to said fluid, so as to gradually reduce the temperature of said fluid and said heat exchanger,

whereby during said heat treatment temperature differentials between said shell and said tubes are minimized.

2. The method of claim 1 wherein said step of circulating said heated fluid through said heat exchanger comprises introducing said fluid through respective first ends of said tubes disposed within said shell, flowing said fluid through said tubes, and thereafter removing said fluid from respective other ends of said tubes.

7. The method of claim 2, 3, or 4 further comprising the step of attaching insulation around the outside surfaces of said heat exchanger, said insulation acting to retard loss of heat through the outside surfaces of said heat exchanger.

4,326,898

METHOD FOR FORMING MATERIAL SURFACES

Roy Kaplow, Newton, and Carl J. Russo, Ipswich, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 960,588, Nov. 13, 1978, abandoned, which is a continuation of Ser. No. 726,354, Sep. 24, 1976, abandoned. This application Feb. 20, 1980, Ser. No. 122,975

Int. Cl.³ C21D *1/48*

U.S. Cl. 148—16.6 **5 Claims**

1. The process for forming an iron or iron alloy surface resistant to oxidation over extended periods which comprises forming an atomically clean surface of iron or an iron alloy in an environment selected from the group consisting of nitrogen, an inert gas and a vacuum free of a gas or liquid which is deteriously reactive with said iron or iron alloy and when forming said atomically clean surface in an environment of said inert gas or said vacuum, subsequently exposing said atomically clean surface to nitrogen to form a surface stable against degradation by oxidation prior to exposing said surface to oxygen.

5. An oxidation-resistant iron surface comprising iron structure including nitrogen atoms interstitially, said surface being essentially free of face-centered cubic iron structures and martensite iron structures, said composition being formed by exposing a surface of atomically clean iron to pure nitrogen for at least about 250×10^{-6} Torr-sec. at 70° F.

4,326,899

METHOD OF CONTINUOUS ANNEALING LOW-CARBON ELECTRICAL SHEET STEEL AND DUPLEX PRODUCT PRODUCED THEREBY

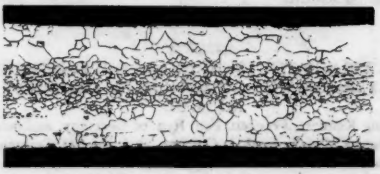
Arthur R. Henricks, Franklin Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sep. 17, 1979, Ser. No. 75,785

Int. Cl.³ H01F *1/00*

U.S. Cl. 148—120 **8 Claims**

1. In the method for producing low-carbon electrical sheet steel, wherein a steel slab containing from 0.02 to 0.04% carbon is processed by hot rolling and cold rolling to produce a cold rolled sheet of from 0.016 to 0.036-inch thick and then continuous annealing the cold rolled sheet, the improvement comprising providing a duplex continuous anneal wherein the sheet is first heated to a temperature within the range 1350° to 1500° F. in a decarburizing atmosphere and there maintained for a time sufficient to decarburize the surfaces of the steel but insufficient to decarburize the steel's mid-section below the range 0.02 to 0.04% carbon, thereafter heating the partially decarburized steel to a temperature within the range 1550° to 1750° F. in a non-decarburizing - non-oxidizing atmosphere to substantially transform the steel's microstructure to austenite and then rapidly cooling the steel to effect a fine grained ferrite



having finely dispersed carbides at the steel's mid-section and a coarse grained ferrite without any significant precipitates at the steel's surface.

4,326,900

WATER-IN-OIL EMULSION EXPLOSIVE COMPOSITION

Katsuhide Hattori; Yoshiaki Fukatsu, and Masao Takahashi, all of Aichi, Japan, assignors to Nippon Oil and Fats Company Limited, Kanagawa, Japan

Filed Nov. 27, 1979, Ser. No. 97,668

Claims priority, application Japan, Nov. 28, 1978, 53/146738

Int. Cl.³ C06B *45/00*

U.S. Cl. 149—2 **12 Claims**

1. Water-in-oil emulsion explosive compositions obtained by dispersing a mixture of (a) a gelatinized nitromethane product obtained by mixing nitromethane with a gelatinizer for nitromethane and (b) hollow microspheres in a water-in-oil emulsion composition comprising (i) ammonium nitrate or a mixture of ammonium nitrate and at least one other inorganic oxidizer salt, (ii) water, (iii) at least one of an oil and wax, and (iv) a sorbitan fatty acid ester surfactant.

4,326,901

FRAGMENTABLE CHARGES OF PROPELLAND POWDER COATED WITH POLYVINYL NITRATE, AND THE PROCESS FOR THEIR MANUFACTURE

Louis Leneveu, and Didier Treneules, both of Chateaulin, France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Sep. 5, 1979, Ser. No. 72,583

Claims priority, application France, Sep. 21, 1978, 78 27118

The portion of the term of this patent subsequent to Jul. 21, 1998, has been disclaimed.

Int. Cl.³ C06B *45/24, 21/00*

U.S. Cl. 149—12 **13 Claims**

1. Process for the manufacture of fragmentable charges from grains of propellant powder containing nitrocellulose comprising (1) malaxating nitrocellulose in a first solvent which has a gelatinizing action for nitrocellulose thus obtaining a paste, (2) extruding the paste to obtain strands, (3) chopping the strands to obtain grains, (4) drying the grains, (5) spraying the grains with a glazing solution containing at least polyvinyl nitrate, a second solvent, and a stabiliser to obtain grains coated with polyvinyl nitrate, (6) evaporating the second solvent and (7) compressing the resulting grains at a temperature of 80° to 120° C. to form said fragmentable charges.

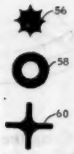
13. Fragmentable charges based on grains of propellant powder containing nitrocellulose, prepared by (1) malaxating nitrocellulose in a first solvent which has a gelatinizing action for nitrocellulose thus obtaining a paste, (2) extruding the paste to obtain strands, (3) chopping the strands to obtain grains, (4) drying the grains, (5) spraying the grains with a glazing solu-

tion containing at least polyvinyl nitrate, a second solvent and a stabilizer to obtain grains coated with poiyvinyl nitrate, (6) evaporating the second solvent and (7) compressing the resulting grains at a temperature of 80° to 120° C. to form said fragmentable charges.

4,326,902
METHOD FOR ULTRASONICALLY WELDING COMPOSITE STRUCTURES

Gerald D. Peddie, Bonita, Calif., assignor to General Dynamics, Convair Division, San Diego, Calif.

Filed Jun. 12, 1980, Ser. No. 158,931
Int. Cl.³ B29C *27/08*; B32B *31/20*
U.S. Cl. 156—73.1 **7 Claims**



1. A method of ultrasonically welding together two or more sheets of thermoplastic material members of selected thickness by the formation of a discrete weld nugget therebetween comprising the steps of:

interposing an energy concentrating member of a color contrasting with the color of said sheets of thermoplastic members between the thermoplastic members to form a sandwich structure;

subjecting the sandwich structure to sufficient pressure to bring said energy concentrating member and thermoplastic material members into intimate contact sufficient to permit ultrasonic welding;

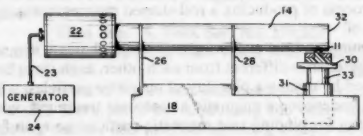
applying sufficient ultrasonic energy to the sandwich structure for sufficient time to cause the thermoplastic material members to be welded together at said energy concentrating member; and

visually inspecting the weld nugget through the sheets of thermoplastic material members to insure that it takes the shape of said energy concentrating member thereby insuring a satisfactory weld joint.

4,326,903
METHOD FOR SECURING PARTS TOGETHER BY ULTRASONIC ENERGY

Arthur M. Summo, Londonderry, N.H., assignor to Branson Ultrasonics Corporation, Newton, Conn.

Filed Dec. 5, 1980, Ser. No. 213,417
Int. Cl.³ B23K *19/04*; B32B *31/20*
U.S. Cl. 156—73.1 **4 Claims**



1. A method for securing two parts to each other by means of a thermoplastic projection extending from one of the parts, said method comprising the steps of:

placing the parts into juxtaposition with the projection extending from one of the parts;

providing a horn adapted to be rendered resonant along its longitudinal axis at a predetermined frequency of vibration, said horn having a cavity disposed substantially at an antinodal region of longitudinal motion of the horn and oriented substantially normal to the direction of longitudinal motion of the horn;

urging the exposed end of the projection into the cavity in a direction normal to the direction of longitudinal motion of the horn;

rendering the horn resonant along its longitudinal axis at a predetermined frequency while concomitantly urging the end of the projection into the cavity to cause a softening and flowing of the projection until the exposed end of the projection is formed to the shape of the cavity;

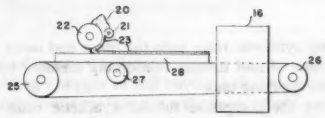
ceasing rendering the horn resonant when the desired degree of forming has occurred, and thereby causing solidification of the softened and flowed material, and

withdrawing the formed projection from the cavity.

4,326,904
HEAT COLLAPSING FOAM SYSTEM

Rene A. Eckert, Simpsonville, and Guenter E. Schmuck, Greenville, both of S.C., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jun. 2, 1980, Ser. No. 152,696
Int. Cl.³ B32B *31/26*; B05D *3/00*
U.S. Cl. 156—85 **12 Claims**



1. A process of treating sheet materials with an aqueous treating composition comprising, providing an aqueous treating composition containing a water soluble surfactant for stabilizing a foam and a water-insoluble defoamer for breaking a foam when heat is applied to permit said composition to be foamed with gas to provide a foam which is stable in the form of a thin layer long enough to be handled and which will collapse completely when heated, foaming said composition, applying said foam to a surface of said sheet material to provide stable foam thereon, and heating said foam on said sheet material to simultaneously cause the foam to collapse and dry the composition.

9. A process as recited in claim 1 in which said aqueous treating composition comprises an adhesive and the sheet material with the foam layer thereon is pressed against another sheet of material prior to heating to simultaneously dry and collapse said foam, whereby said adhesive is prevented from migrating away from the glue line in the resulting laminate.

4,326,905
PROCESS FOR MANUFACTURING SYNTHETIC RESIN HOSE HAVING A REINFORCING MEMBER EMBEDDED THEREIN AND APPARATUS THEREOF

Kenichi Tanaka, Musashino, Japan, assignor to Kakuichi Company Ltd., Japan

Continuation of Ser. No. 968,753, Dec. 13, 1978, abandoned, which is a division of Ser. No. 902,825, May 4, 1978, Pat. No. 4,194,942. This application Sep. 19, 1980, Ser. No. 188,702
Claims priority, application Japan, Oct. 15, 1977, 52-12296
Int. Cl.³ B65H *81/00*; B29C *19/00, 19/04*; C09J *5/02*
U.S. Cl. 156—149 **9 Claims**

1. A process for manufacturing a synthetic resin hose having a reinforcing member embedded, the improvements comprising the steps of;

applying a bonding agent to a plurality of warp materials in a bonding agent tub;

guiding said plurality of bonding agent bearing warps through yarn guide holes provided in a diameter adjusting

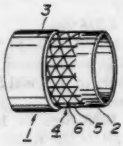
disc to the outer peripheral surface of a hollow cylindrical member;

forming a warp tubular member arranged side by side with a space each other and parallel to the axis of the tubular member by drawing it in the longitudinal axial direction of a hose being formed;

braiding a plurality of braiding yarns to form a braid member consecutively in overlying relation around on the outer peripheral surface of said warp tubular member, thereby forming a tubular reinforcing member;

bonding warps to braided yarns at the contacts therebetween by passing a first heating unit, thereby heat-setting said tubular reinforcing member;

solidifying said tubular reinforcing member by passing a first cooling unit;



coating synthetic resin onto the inner and outer peripheral surface of said tubular reinforcing member by passing a resin applying unit;

forming the composite tubular synthetic resin hose with embedded tubular reinforcing member by passing a second cooling unit;

drawing the composite tubular body thus formed while cooling the same; and

taking up said synthetic resin hose to a winding-up reel under a constant tension; and

said steps are combined in the order described successively from one end of the hollow cylindrical member to said winding-up reel.

4,326,906

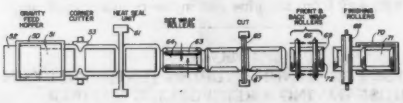
DISPLAY MOUNT AND METHOD

Carroll N. Cross, Rte. 2, Box 741, Maitland, Fla. 32751

Filed May 2, 1980, Ser. No. 145,775

Int. Cl.³ B31F *1/00*

U.S. Cl. 156—201 **10 Claims**



1. A process for making a display mount, or the like, comprising the steps of:

applying glue to one side of heat sealable binding material;

feeding panels onto said glued surface of said binding material;

feeding heat sealable polymer film from a roll adjacent to said binding material on the side opposite from said panels attached thereto;

sealing said polymer film to said binding material;

cutting said binding material and polymer film between said panels; and

rolling said binding material and polymer film over multiple edges of each said panel onto the back of said panel to form a polymer film pocket on the face of a panel.

4,326,907

METHOD OF IDENTIFYING PISTON RINGS

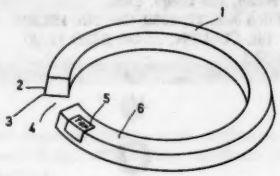
Horst Bornefeld, Burscheid; Hans P. Fort, Bergisch Gladbach, and Werner Engel, Leverkusen, all of Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Sep. 26, 1979, Ser. No. 79,214

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1978, 2841917

Int. Cl.³ B32B *1/04*; F02F *5/00*

U.S. Cl. 156—212 **3 Claims**



1. A method of identifying the orientation of a piston ring having opposite annular flank faces, an inner circumferential face and an outer circumferential running face; comprising the step of applying, in a single operational step, a visual, thin synthetic foil marking of less than 2μ thick exclusively to one of said flank faces and at least one part of said running face, whereby subsequent to said step the visual marking extends on said one flank face and continues on said running face.

4,326,908

PROCESS OF PRODUCING ROLL-SHAPED MAGNET

Koji Hiya, Hirakata; Yoshiyuki Miyoshi, Moriguchi, and Kanji Machida, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

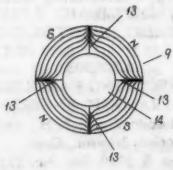
PCT No. PCT/JP79/00168, § 371 Date Mar. 7, 1980, § 102(e) Date Mar. 6, 1980, PCT Pub. No. WO80/00196, PCT Pub. Date Feb. 7, 1980

PCT Filed Jun. 29, 1979, Ser. No. 190,852

Claims priority, application Japan, Jul. 7, 1978, 53/83371

Int. Cl.³ H01F *3/02*

U.S. Cl. 156—215 **8 Claims**



1. A process of producing a roll-shaped magnet, comprising the steps of:

(a) forming at least two magnetic sheets having magnetic characteristics different from each other, each sheet being formed by mixing a plurality of magnetic particles, which have undergone a magnetic anisotropic treatment, with a medium for binding said magnetic particles so as to form a mixture, and then rolling said mixture to form a sheet wherein said magnetic particles are oriented in the direction of rolling;

(b) laminating the magnetic sheets together so as to form a laminating body;

(c) forming a plurality of wedge-shaped indentations in one surface of said laminated body;

(d) winding the laminated body around a shaft, the surface with indentations contacting said shaft so as to form the inner peripheral surface, each successive layer having indentations which are aligned so as to form a plurality of

substantially radial axes, the shaft being a magnetizing pole; and

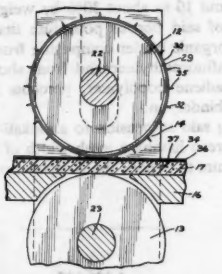
(e) magnetizing the laminated body.

4,326,909

METHOD AND APPARATUS FOR FORMING A PERMEABLE INSULATION BOARD FOR BUILDING CONSTRUCTION

Raymond F. Slavik, Albertville, Minn., assignor to Minnesota Diversified Products, Inc., New Brighton, Minn.

Filed Jun. 30, 1980, Ser. No. 164,023
Int. Cl.³ B32B *31/18, 3/10*
U.S. Cl. 156—253 **3 Claims**



1. A method of forming an insulation board having good moisture permeability, including the steps of:

A. first bonding a first surface of a fluid permeable insulating sheet of good heat insulation properties to a layer of impermeable highly heat reflective foil;

B. then penetrating the foil surface and the first surface of the insulating sheet to render the foil fluid permeable by forming a plurality of perforations through the foil layer and into the insulating sheet, said perforating being made by passing said mutually bonded foil layer and insulating sheet under a roller having a perforated outer shell, having the spikes of tacks extending through said perforations in said outer shell, said tack spikes being of lesser diameter than said roller shell perforations, and each such tack being mounted loosely with respect to said outer roller in such a manner as to permit some transverse movement of said spike with respect to the surface of the outer roller but to prevent withdrawal of the spike from its perforation in said roller.

4,326,910

TRANSFER APPARATUS AND METHOD

Jesse B. Davis, P.O. Box 588, 8 Sagamore Hill Dr., Port Washington, N.Y. 11050

Filed Sep. 24, 1980, Ser. No. 190,328
Int. Cl.³ B65C *9/25;* **C09J** *5/00;* **B30B** *5/02;* **B32B** *31/00*
U.S. Cl. 156—540 **12 Claims**

1. In an apparatus for controllably preheating the receiving surface of a work piece by conducting the latter through a pretreating station, and prior to adhering a layer of material from said apparatus including;

a belt guide system having a plurality of spaced apart guide rollers 31 and 32,

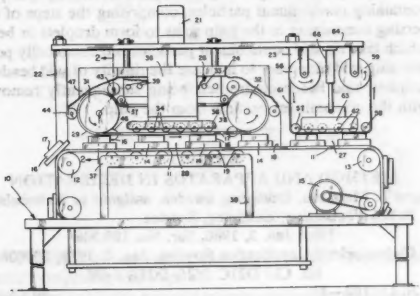
a thermal belt 29 carried on said belt guide system and defining a closed belt circuit around said guide rollers 31 and 32,

a heat source disposed adjacent to a segment of said closed belt circuit for controllably raising the belt temperature along said segment, and

drive means engaging said belt guide system and being operable to progress the belt heated segment from said heat source, to said pretreating station, whereby to contact said work piece at said pretreating station,

a conveyor chain operably guided to pass continuously adjacent to a heated portion of said thermal belt, said chain being adapted to carry at least one work piece in a manner that the receiving surface of the latter is disposed in heat exchange contact with the thermal belt,

a transfer station positioned adjacent to said preheat station and arranged coextensively with said conveyor chain and including;



a plurality of pressure rollers,

means holding a supply of foil having a thermally transferable decorative layer thereon, a thickness of said foil being registered intermediate a work piece heated surface, and said plurality of pressure rollers,

whereby the thermally transferable foil layer will be urged against the work piece heated surface to cause transfer of the said layer onto said work piece surface without interrupting movement of the conveyor chain.

4,326,911

REACTIVE ION ETCHING OF III-V COMPOUNDS INCLUDING INP, GAAS-INP AND GAALAS

Richard E. Howard, Holmdel, and Evelyn L. Hu, Somerset, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 116,540, Jan. 29, 1980, abandoned. This application Dec. 4, 1980, Ser. No. 212,976
Int. Cl.³ H01L *21/306*
U.S. Cl. 156—643 **11 Claims**

1. A process for reactive-ion-etching a III-V semiconductor substrate made of one or more compounds selected from the set of InP, GaAs-InP alloys and GaAlAs in which a plasma is ignited in a gas disposed between two electrodes, and said substrate is placed on the cathode electrode to which rf power is applied

characterized in that

said gas comprises CCl_2F_2.

4,326,912
PROCESS FOR IMPROVING THE QUALITY OF PULP OBTAINED FROM WASTEPAPER

Christopher C. Mollett, Brighton, England, assignor to Pira, The Research Association for the Paper and Board, Printing and Packaging Industries, Surrey, England

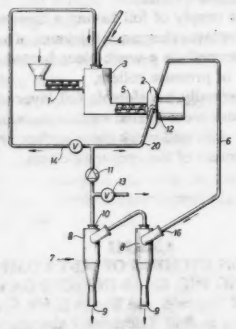
Filed Sep. 30, 1980, Ser. No. 192,209
Claims priority, application United Kingdom, Oct. 1, 1979, 33924/79
Int. Cl.³ D21C 5/02
U.S. Cl. 162—5 13 Claims

1. A method for improving the quality of wastepaper pulp containing contaminant particles, comprising the steps of dispersing a monomer in the pulp so as to form droplets or beads which take up said contaminant particles and chemically polymerizing said monomer to increase the rigidity of said beads or droplets; said beads or droplets being subsequently removed with the contaminant particle from the pulp.

4,326,913
METHOD AND APPARATUS IN DEFIBRATION

Agne T. Mattsson, Enköping, Sweden, assignor to Aktiebolaget Bahco Ventilation, Enköping, Sweden

Filed Jan. 2, 1980, Ser. No. 109,046
Claims priority, application Sweden, Jan. 4, 1979, 7900084
Int. Cl.³ D21C 3/26; D21B 1/04
U.S. Cl. 162—17 10 Claims



1. An apparatus for defibrating wood chip-like vegetable material, comprising:
- a means defining a first source of steam;
- a refiner having a housing and including means for reducing wood chip-like vegetable material to pulp;
- a first refiner inlet in said refiner housing for introducing vegetable material;
- means for transporting said vegetable material to said first refiner inlet;
- means connected upstream from said first refiner inlet and further connected to said first source of steam for introducing steam to said wood chip-like vegetable material;
- a second refiner inlet in said refiner housing;
- a refiner outlet for pulp and steam, said refiner outlet being spaced from said second refiner inlet across an interior volume of said housing;
- at least one separator connected to said refiner outlet for separating said steam and pulp, each said at least one separator being adapted to be pressurized by said separated steam and having a steam outlet, said separated steam defining a second source of steam;
- conduit means for connecting said second source of steam to said second refiner inlet; and
- means for increasing the pressure of said separated steam;
- whereby said separated steam flows through at least a portion of said refiner and helps transport said pulp from said refiner.

4,326,914
DIAPHRAGMS FOR ELECTROCHEMICAL CELLS AND THE MANUFACTURE THEREOF

Karl Höhne, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

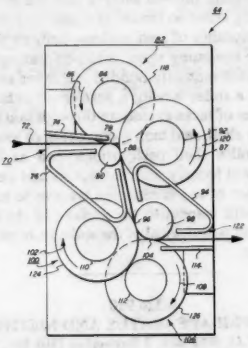
Filed Sep. 9, 1980, Ser. No. 185,431
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1979, 2938123
Int. Cl.³ C25B 13/00
U.S. Cl. 162—105 7 Claims

1. A method for the manufacture of a diaphragm of fibrous potassium titanate and a non-fibrous organic binder therefor, for an electrochemical cell, which comprises:
- a. forming a suspension of said fibrous potassium titanate and from about 10 to about 30% by weight, based upon the weight of said fibrous potassium titanate, of said non-fibrous organic binder comprising from about 30 to 60% polytetrafluoroethylene and from about 40 to 70% styrene-butadiene copolymer, percents by weight of the organic binder; and
- b. applying said suspension to an alkali-resistant plastic or metal screen having a mesh width of between about 0.1 and 0.4 mm to deposit the components of said suspension thereon.

4,326,915
SHEET DE-CURLER

Edward C. Mutschler, Jr., Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 15, 1979, Ser. No. 94,606
Int. Cl.³ D21F 1/40; D21H 1/00; D21J 1/14
U.S. Cl. 162—271 7 Claims



1. An apparatus for de-curling sheet material, including:
- a first substantially rigid rod;
- a first pair of substantially rigid rollers, one of said first pair of rollers contacting said first rod in a first contact region and the other of said first pair of rollers contacting said first rod in a second contact region;
- means for rotating said first pair of rollers to move the sheet material through the contact regions to bend the sheet material about said first rod in a first direction;
- a second substantially rigid rod;
- a second pair of substantially rigid rollers, one of said second pair of rollers contacting said second rod in a first contact region and the other of said second pair of rollers contacting said second rod in a second contact region; and
- means for rotating said second pair of rollers to move the sheet through the contact regions to bend the sheet material in a second direction opposed to the first direction.

4,326,916

BREAST BOX NOZZLE FOR A PAPER MACHINE

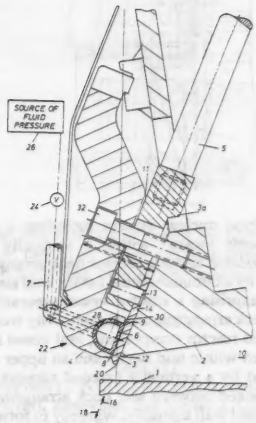
Heinrich Flaig, Heidenheim, and Karl Wolf, Heidenheim-Schnaitheim, both of Fed. Rep. of Germany, assignors to J. M. Voith, GmbH, Heidenheim, Fed. Rep. of Germany

Filed Oct. 16, 1980, Ser. No. 197,519

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1979, 2942966

Int. Cl.³ D21F 1/06

U.S. Cl. 162—344 6 Claims



1. A breast box nozzle assembly, comprising nozzle passage means terminating in a nozzle passage discharge orifice for the flow therethrough of a fluid stream of pulp stock, said nozzle passage means comprising at least upper disposed lip structure means, a mounting surface carried by said lip structure means, a shutter situated against said mounting surface carried by said lip structure means and adjustably movable along said mounting surface in at least two directions for adjustably determining the effective opening and effective configuration of said discharge orifice, when moved in a first of said two directions along said mounting surface said shutter extending generally transversely relatively further into said stream of fluid pulp, when moved in a second of said two directions opposite to said first direction and along said mounting surface said shutter extending generally transversely relatively less into said stream of fluid pulp, adjustment means for adjustably moving said shutter in said first and second directions, and support means for operatively applying a counter pressure to a downstream side of said shutter which counter pressure opposes the fluid pressure applied to an upstream side of said shutter by said stream of fluid pulp and urges said shutter against said mounting surface, said support means comprising a support member and elastomeric means operatively interposed between said support member and said downstream side of said shutter, said elastomeric means being effective to react against said support member and apply a reacting force as said counter pressure to said downstream side of said shutter to thereby hold said shutter against said mounting surface while still permitting said adjustment means to adjustably move said shutter in either of said first and second directions.

4,326,917

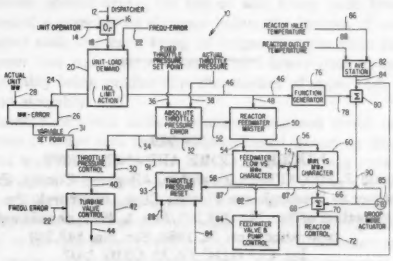
METHOD OF NUCLEAR REACTOR CONTROL USING A VARIABLE TEMPERATURE LOAD DEPENDENT SET POINT

Joseph J. Kelly, Jr., and George E. Rambo, both of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 2, 1979, Ser. No. 80,977

Int. Cl.³ G21C 7/00

U.S. Cl. 376—216 11 Claims



1. A method of controlling the power output of a nuclear reactor comprising the steps of:

providing a variable average reactor coolant temperature set point having a constant temperature portion and a decreasing temperature portion for controlling the reactor power by control rod movement;

providing a control range of average reactor coolant temperatures below said variable temperature set point for controlling the reactor power in response to variable feedwater flow; and

switching control between said variable coolant temperature set point and said control range of temperatures whenever a large change in reactor power output is required.

4,326,918

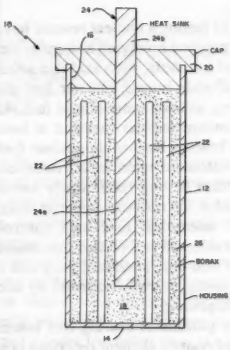
STORAGE ASSEMBLY FOR SPENT NUCLEAR FUEL

Melvin E. Lapides, Mountain View, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 13, 1980, Ser. No. 130,134

Int. Cl.³ G21C 19/20

U.S. Cl. 376—272 5 Claims



1. An assembly for storing spent fuel rods from a nuclear reactor, said assembly comprising:

(a) housing means including a closed inner chamber for containing said fuel rods, said housing means being adapted for positioning underground;

(b) means located partially within said inner chamber and partially outside said housing means for transferring heat

generated by the fuel rods contained within said housing chamber from the latter to said surrounding ground; and

(c) particulate material located within said chamber and surrounding the fuel rods contained therein, said material being of a type which serves as a heat transfer media between said contained fuel rods and said heat transferring means and which also fuses into a solid mass around said contained rods if said heat transferring means malfunctions or otherwise fails to transfer said generated heat out of said chamber in a predetermined manner.

4,326,919

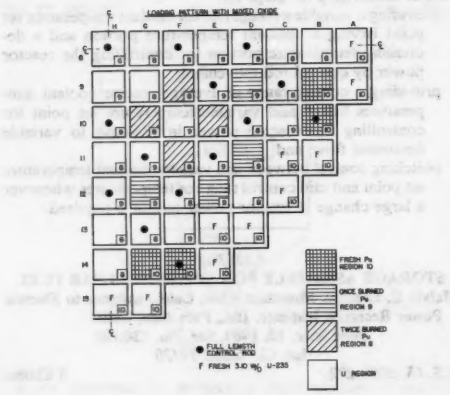
NUCLEAR CORE ARRANGEMENT

Donald J. Hill, O'Hara Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 829,703, Sep. 1, 1977, abandoned. This application Apr. 24, 1980, Ser. No. 143,240

Int. Cl.[3] G21C *19/20*; G21G *1/02*

U.S. Cl. 376—267 8 Claims


LOADING PATTERN WITH MIXED OXIDE
FRESH Pu REGION 10
ONCE BURNED Pu REGION 9
TWICE BURNED Pu REGION 8
U REGION
FULL-LENGTH CONTROL ROD
F FRESH 3.10 w/o U-235

1. A method of fueling a nuclear reactor having discrete core positions, each position receiving a singular vertically disposed bundled-rod fuel assembly, each said fuel assembly including a plurality of fuel rods having nuclear fuel disposed within a metallic cladding, at least some of said fuel assemblies bearing fissionable plutonium nuclear fuel and at least some other of said assemblies bearing fissionable nuclear fuel essentially free of fissionable plutonium upon initial insertion into said core, said reactor further having rectilinearly movable control elements, the number of control elements being less than the number of fuel assemblies, each said control element being insertable into a selected one of said fuel assemblies in a corresponding one of said core positions, each said control element, upon insertion, being laterally bounded by said fuel assembly, said method comprising;

(a) inserting a plutonium bearing fuel assembly into one of said selected control element receiving core positions, said position being the position of highest control element worth in the N−1 configuration based upon a core configuration having only fuel assemblies essentially free of fissionable plutonium; and

(b) inserting said plutonium bearing fuel assemblies and said fuel assemblies essentially free of fissionable plutonium into the remaining core positions.

4,326,920

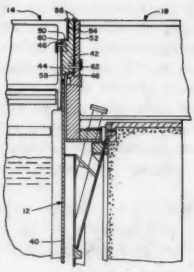
NUCLEAR REACTOR INCLUDING A REACTOR VESSEL AND TECHNIQUE FOR SUPPORTING THE LATTER

Joseph V. Facha, Reseda, Calif.; John P. Cook, Chattanooga, Tenn., and William H. Dusterman, Woodland Hills, Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 23, 1979, Ser. No. 32,283

Int. Cl.[3] G21C *13/02, 9/00*

U.S. Cl. 376—205 9 Claims



1. In a pool type nuclear reactor including a number of reactor components located within a vertically extending cavity which is located under a reactor deck arrangement and which is defined by a circumferential cavity wall assembly, the improvement comprising a reactor vessel separated and distinct from said deck arrangement and said cavity wall assembly for containing said reactor components, said vessel including a main body located within said cavity and an upper circumferential rim formed by a vertically exteded support flange located and interlocked between said deck arrangement and an upper section of said wall assembly, whereby to form a support means for said vessel body within said cavity and said deck arrangement above said vessel body, said support means including a first downwardly directed, circumferential shoulder extending around and forming part of said support flange, a first upwardly directed, circumferential shoulder extending around and forming part of said cavity wall assembly said first upwardly directed shoulder cooperating with said first downwardly directed shoulder for supporting said vessel within said cavity, a second downwardly directed circumferential shoulder extending around and forming part of said deck arrangement, a second upwardly directed, circumferential shoulder extending around and forming part of said support flange on the opposite side of and above said first downwardly directed shoulder but below the top of said flange, said second upwardly directed shoulder cooperating with said second downwardly directed shoulder for supporting said deck arrangement over the main body of said vessel and means for sealing between said support flange and both said deck arrangement and said wall assembly, said sealing means displaying at least a limited degree of compliance whereby to accomodate thermal displacement.

4,326,921

CONTROL ROD GUIDE THIMBLE FOR NUCLEAR REACTOR FUEL ASSEMBLIES

Dennis J. Cadwell, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 16, 1980, Ser. No. 150,482

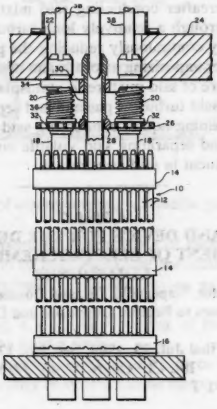
Int. Cl.[3] G21C *3/30*

U.S. Cl. 376—353 5 Claims

1. A fuel assembly for a nuclear reactor comprising an array of fuel rods held in spaced relationship with each other by a series of grids spaced along the fuel rod length, multiple control rod guide thimbles interspersed among the fuel rods extend the length of said assembly and are attached to said grids to provide a basic skeleton structure for the assembly, and an

extension attached to the upper end of each of said guide thimbles;

insets in the form of local deformations in the guide thimble walls which project inwardly toward the guide thimble



axis, said insets serving to reduce the force, and therefore the wear, caused by lateral vibrating motion between the guide thimble and control rod adapted to reciprocate therein.

4,326,922

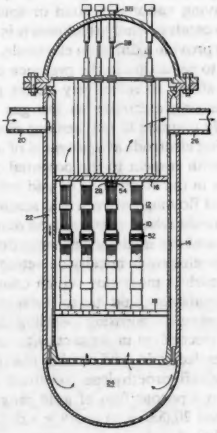
COMPOSITE NUCLEAR FUEL ASSEMBLY

Harry M. Ferrari, Edgewood, and Walter J. Dollard, Churchill, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 875,653, Feb. 6, 1978, abandoned. This application Jan. 31, 1980, Ser. No. 117,418

Int. Cl.³ G21C *3/30*

U.S. Cl. 376—435 **7 Claims**



1. A composite nuclear fuel assembly adapted for use with a thermal nuclear reactor having a liquid coolant flowing upwardly through a core including said assemblies in a vertical orientation, said assembly comprising:

a plurality of elongated coextending cylindrical upper nuclear fuel rods having fissionable nuclear fuel encased in a sealed cladding, said upper rods arranged in a closely spaced array;

a plurality of upper lattice structures disposed about said array of upper rods spaced at preselected elevations along said upper rods for laterally supporting said rods in individual cells, each said cell laterally enclosing a corresponding one of said upper rods;

a plurality of elongated cylindrical coextending lower nuclear fuel rods having fissionable nuclear fuel encased in a sealed cladding, said lower rods being arranged in a closely spaced array, the top of said lower rods being spaced a preselected distance below the bottom of said upper rods and each being of larger diameter than said upper fuel rods, the number of said lower rods in said assembly being smaller than the number of upper rods in said assembly; and

a plurality of lower lattice structures disposed about said array of lower rods spaced at preselected elevations along said lower rods for laterally supporting said lower rods in individual cells, each said cell laterally enclosing a corresponding one of said upper rods the lateral periphery of said lower lattice structures being sized substantially similar to the lateral periphery of said upper lattice structures;

said upper and lower rods being the only fuel bearing rods in said assembly.

4,326,923

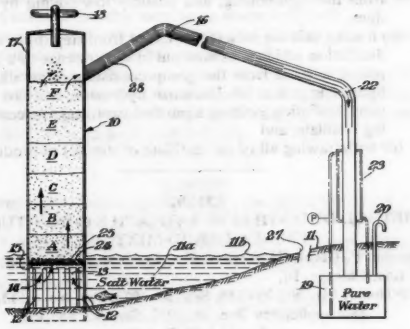
PURIFICATION APPARATUS

Carl W. Mortenson, 1175 Pleasant Hill Rd., Newark, Del. 19711

Filed Jan. 9, 1980, Ser. No. 110,636

Int. Cl.³ C02F *1/14*; B01D *3/02*

U.S. Cl. 202—185 R **10 Claims**



1. Apparatus for the purification of an impure volatile liquid with the assistance of solar energy which apparatus comprises a distilling device comprising a column and a condenser;

in said column, packing comprising particulate material varying in thermal conductivity, the said material being contained within said column with the poorest thermal conductor being in the closest position within said column to said impure liquid with successively better thermal conductors being above it to form a thermal gradient with the best thermal conductor being near the outlet of said column and the said material being inert relative to said impure liquid;

means to mount said apparatus to expose it to the rays of the sun for capture of solar energy, thereby to heat said packing material and vaporize said liquid; and

said condenser comprising means to condense said vapor to a liquid, thereby converting the liquid to a purified state.

4,326,924
STABILIZATION OF METHYLCHLOROFORM

Frances M. Cummings, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 61,799, Jul. 30, 1979, abandoned. This application Nov. 17, 1980, Ser. No. 207,520
Int. Cl.³ B01D 3/34
U.S. Cl. 203—6 **7 Claims**

1. In a process for purifying crude methylchloroform by distillation wherein the improvement resides in distilling the crude methylchloroform in the presence of from about 0.02 to 0.1 percent by weight, based on weight of crude methylchloroform, of polyalkylene glycol having an average molecular weight of from about 300 to about 500 so as to inhibit the rate of decomposition of methylchloroform to vinylidene chloride and so as to not significantly co-distill with methychloroform during said distillation.

4,326,925
PROCESS FOR THE PURIFICATION OF CAPROLACTAME

Paolo Senni, Colleferro, and Domenico Astarita, Segni-Colleferro, both of Italy, assignors to SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Feb. 19, 1980, Ser. No. 122,675
Claims priority, application Italy, Feb. 28, 1979, 20612 A/79
Int. Cl.³ B01D 3/34
U.S. Cl. 203—37 **13 Claims**

1. A process of purifying raw caprolactame by vacuum distillation, wherein said distillation is carried out, in either a continuous or discontinuous manner, in the following steps and in the order listed herebelow:

(a) feeding said raw caprolactame to a fast vacuum distillation, said fast vacuum distillation yielding a caprolactame containing distillate;

(b) feeding all of the distillate from step (a) directly to a distillation with vacuum rectification, with separation from the high-boiling, and possibly low-boiling by-product;

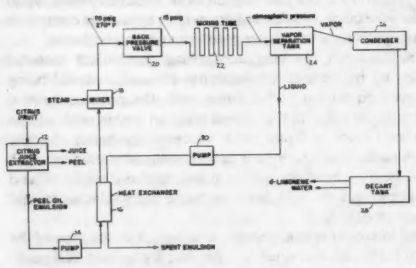
(c) feeding said caprolactame yielded from step (b) to a fast distillation which is carried out in the presence of a compound selected from the group consisting of an alkaline hydroxide and an alkaline-earth hydroxide, said fast vacuum distillation yielding a purified caprolactame containing distillate; and

(d) withdrawing all of the distillate of step (c) as product.

4,326,926
METHOD OF DISTILLING A VOLATILE CONSTITUENT FROM A LIQUID MIXTURE

Gordon P. Gerow, Davenport, Fla., assignor to FMC Corporation, Chicago, Ill.

Division of Ser. No. 399,238, Sep. 20, 1973, Pat. No. 4,113,573. This application Dec. 28, 1977, Ser. No. 865,150
Int. Cl.³ B01D 3/06
U.S. Cl. 203—91 **2 Claims**

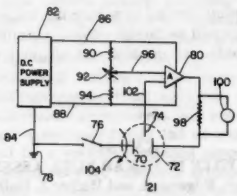


1. In a process for distilling a volatile constituent from a liquid mixture of immiscible materials, the steps of heating said mixture to a temperature in the range of from about 250° F. to about 275° F. while said mixture is in a flowing state and at a superatmospheric pressure, substantially and abruptly reducing the major portion of the superatmospheric pressure of said mixture to rapidly vaporize a constituent of said mixture, immediately thereafter conducting said mixture and vaporized constituent through a relatively long turbulent passage while simultaneously continuously reducing the pressure to provide heat for further vaporizing a constituent of said mixture, reducing the pressure of said mixture to atmospheric pressure at the outlet end of said turbulent passage and separating the vapors from the remaining liquid, condensing said vapors to obtain a condensate, and separating said volatile constituent from the carrier constituent in said condensate.

4,326,927
METHOD AND DEVICE FOR THE DETECTION AND MEASUREMENT OF ELECTROCHEMICALLY ACTIVE COMPOUNDS

Joseph R. Stetter, Naperville, Ill., and Donald R. Rutt, Merrick, N.Y., assignors to Becton, Dickinson and Company, Paramus, N.J.

Filed Jul. 25, 1980, Ser. No. 172,170
Int. Cl.³ G01N 27/46, 27/52
U.S. Cl. 204—1 T **5 Claims**



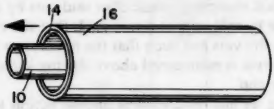
1. An electrochemical sensing device comprising a sensing electrode, a counterelectrode, an electrolyte in contact with said sensing electrode and counterelectrode, said sensing electrode comprising a porous hydrophobic polytetrafluoroethylene substrate having vapor deposited or sputtered thereon a porous gold film catalyst whose thickness is in the range of 200 Å to 20,000 Å to provide a diffusion electrode, said film of gold being subjected to reduction in the presence of H_2 to enhance its stability and ability to selectively detect gases, means for exposing said sensing electrode to the gas to be detected, means electrically coupled to said sensing electrode for maintaining said sensing electrode at a potential of about 0.4 volts to about 1.5 volts with respect to the potential of the reversible hydrogen couple in the electrolyte of said cell, and means for measuring current flowing between said sensing electrode and said counterelectrode which measured current is a measure of the concentration of the noxious gas being detected.

3. A method for electrochemically detecting a noxious gas in the presence of carbon monoxide which comprises feeding a gaseous sample containing said gas to the sensing electrode of an electrochemical cell comprising a sensing electrode, a counterelectrode, an electrolyte in contact with said sensing electrode and counterelectrode, said sensing electrode comprising a porous polytetrafluoroethylene substrate having vapor-deposited thereon a porous film of gold ranging in thickness between 200 Å and 20,000 Å to provide a diffusion electrode, reducing said film of gold in the presence of hydrogen to enhance its stability and ability to selectively detect gases, maintaining the sensing electrode at a potential of about 0.4 volts to about 1.5 volts with respect to the potential of the reversible hydrogen couple in the electrolyte of said cell, and measuring current flowing between said sensing electrode and said counterelectrode which measured current is a measure of the concentration of the noxious gas being detected.

4,326,928
METHOD OF ELECTROFORMING

William P. Dugan, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Jan. 26, 1981, Ser. No. 228,430
Int. Cl.[3] C25D 1/02
U.S. Cl. 204—9 2 Claims

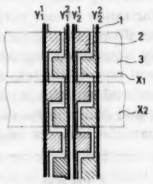


1. The method of electroforming a metallic part comprising the steps of:
- depositing an electroless base coating of metal on a tubular plastic mandrel of heat shrinkable material such as polyethylene or polypropylene and having an integral solid wall;
- electrodepositing a secondary coating of metal over said base coating to form a part;
- mechanically removing a portion of the metal coatings off at least one extremity of the part to facilitate removal of the mandrel;
- thereafter heating the coated mandrel to shrink the mandrel away from the part formed by the coating; and
- physically removing the mandrel from the finished part.

4,326,929
FORMATION OF AN ELECTRODE PATTERN

Shigehiro Minezaki, Ikoma; Toshiaki Takamatsu, Tenri, and Shuichi Kozaki, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 3, 1979, Ser. No. 81,439
Claims priority, application Japan, Oct. 3, 1978, 53-122234
Int. Cl.[3] C25D 11/02; B05D 5/00, 5/12
U.S. Cl. 204—15 10 Claims

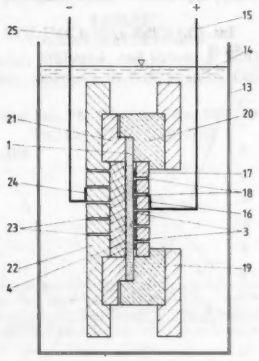


1. A method for forming on a substrate a metal electrode pattern and a transparent electrode pattern both of which overlap at least in part with each other, said method comprising the steps of:
- etching a transparent, electrically conductive film deposited on a major surface of the substrate for the formation of the transparent electrode pattern;
- overlaying the whole of the major surface of the substrate with a layer of photoresist;
- removing a portion of said photoresist layer to form an area defining a metal electrode pattern;
- coating substantially the entire major surface of the substrate with a layer of metal electrode material, said metal electrode material extending into said area defining said metal electrode pattern; and
- removing the remaining photoresist layer with the aid of a resist remover thereby forming the metal electrode pattern.

4,326,930
METHOD FOR ELECTROLYTIC DEPOSITION OF METALS

Hartmut Nagel, Dortmund, Fed. Rep. of Germany, and Samuel Stucki, Baden, Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 9, 1979, Ser. No. 10,684
Claims priority, application Switzerland, Apr. 14, 1978, 4005/78
Int. Cl.[3] C25D 5/54, 5/56, 7/04
U.S. Cl. 204—20 23 Claims

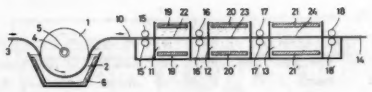


1. A method for electrolytic deposition of metals on a solid electricaly nonconductive surface, comprising:
- impregnating a solid electrically nonconductive material with a reducible metal salt thereby forming a solid electrolyte material;
- placing said solid electrolyte material between an anode and a cathode thereby forming an electrolytic cell;
- immersing said cell in a container of distilled water maintained at a constant temperature; and
- impressing a current across said electrodes of a potential sufficient to electrolyze said metal ions thereby resulting in the deposition of a metal layer along the surface of said electrolyte adjacent said cathode.

4,326,931
PROCESS FOR CONTINUOUS PRODUCTION OF POROUS METAL

Eiji Kamijo, Itami; Kazuhito Murakami, Osaka, and Katsuto Tani, Itami, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 12, 1978, Ser. No. 950,615
Int. Cl.[3] C25D 5/54, 7/06
U.S. Cl. 204—22 5 Claims



1. A process for continuously plating a non-conductive porous tape, comprising the steps of:
- treating said tape to render it electrically conductive,
- moving said electrically conductive tape through an electrolytic bath in close contact with a moving cathode immersed in said bath to electrodeposit a layer of metal on the surface of said tape to increase the electrical conductivity of said tape, and
- electroplating said tape having increased electrical conductivity in a plurality of electrolytic baths each having feed

rolls outside the bath for feeding said tape into the bath to electroplate said tape to a desired thickness.

4,326,932

HYDROGENATION

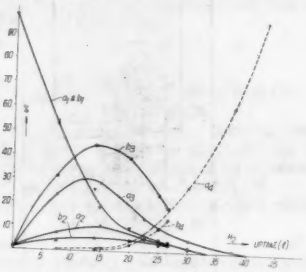
Albert Fröling, Vlaardingen; Rudolph O. de Jongh, The Hague, and Josephus M. A. Kemps, Udenhout, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 866,147, Dec. 30, 1977, abandoned. This application Jan. 8, 1979, Ser. No. 2,048

Claims priority, application United Kingdom, Dec. 31, 1976, 54485/76

Int. Cl.³ C25B *3/04*; C11C *3/12*

U.S. Cl. 204—59 R **17 Claims**



1. Process for the selective hydrogenation of a polyunsaturated organic compound containing more than one double bond in a carbon chain or ring comprising hydrogenating said compound with hydrogen in the presence of a metallic hydrogenation catalyst chosen from the group consisting of palladium, platinum, rhodium, ruthenium and nickel, at a temperature of between −20° C. and 200° C. and under a pressure of between 1 and 25 atm., and applying an external electric potential differing from the equilibrium potential and having a value of between 0 V and −3 V as measured against a saturated calomel electrode, to the catalyst while it is in contact with a liquid chosen, which liquid contains 0.001 to 0.1 mole per liter of an electrolyte chosen from the group consisting of quaternary ammonium salts, sodium dodecyl-6-sulphonate, sodium acetate, sodium hydroxide and sodium methanolate.

4,326,933

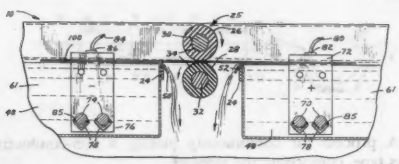
ELECTRO-CHEMICAL DEBURRING METHOD

Winston E. Sabatka, Lakeville, and Wilburn M. Bloomquist, Bloomington, both of Minn., assignors to Finishing Equipment, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 896,465, Apr. 14, 1978, abandoned. This application May 9, 1979, Ser. No. 37,297

Int. Cl.³ C25F *3/02, 3/14*

U.S. Cl. 204—129.6 **2 Claims**



1. A method of removing burrs from flat sheet metal stampings including the steps of:

A. conveying a succession of spaced-apart horizontally disposed flat sheet metal stampings in a single horizontal plane between spaced pairs of vertially disposed horizontal rollers.

B. situating a vat having a horizontal top leading edge lip and a horizontal top trailing edge lip between each adjacent pair of rollers such that the lips are in line with and below the path of said stampings between the roller pairs, the space between adjacent vats being less than the linear dimension of the stampings in the direction the stampings are being conveyed.

C. providing an electrolyte bath for inundating at least the edges of said stampings while over said vats by delivering electrolyte to said vats at a rate such that the electrolyte overflows the vats and such that the uppermost surface of the electrolyte is maintained above the top surface of said stampings; and

D. providing an electro-chemical anodic action to remove any burrs on the stampings by providing electrodes in each vat and providing an electromotive force to each electrode such that the electrodes in every second vat are charged negatively with respect to the electrodes in the adjacent vats.

4,326,934

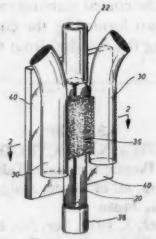
CONTINUOUS DIELECTROPHORETIC CELL CLASSIFICATION METHOD

Herbert A. Pohl, 515 Harned Ave., Stillwater, Okla. 74074

Filed Dec. 31, 1979, Ser. No. 108,709

Int. Cl.³ B01D *57/02*

U.S. Cl. 204—180 R **4 Claims**



1. A method of classifying neutral biological particles based on the electrical polarization of said particles comprising,

generating a non-uniform electric field between a plurality of approximately isomotive electrodes in which r_{60} is not greater than about one millimeter, and

exposing a stream of said particles in a biologically non-toxic fluid medium to said non-uniform electric field by passing said stream of particles between said electrodes.

4,326,935

ELECTROCHEMICAL PROCESSES UTILIZING A LAYERED MEMBRANE

Karl Moeglich, Dunedin, Fla., assignor to Innova, Inc., Clearwater, Fla.

Division of Ser. No. 957,876, Nov. 6, 1978, Pat. No. 4,242,193. This application Jan. 10, 1980, Ser. No. 110,997

Int. Cl.³ B01D *57/02*; C25B *1/22*; C02F *1/46*

U.S. Cl. 204—180 P **13 Claims**

1. A method of concentrating hexavalent chromium utilizing an electrolysis system including a block of ion-transfer membrane material, means defining an electrode chamber in the block extending the length of the height of the block, and anode disposed in the electrode chamber in the block, and a cathode formed to allow liquid passage therethrough surrounding the membrane material block, with a casing surrounding the cathode, the method comprising the steps of:

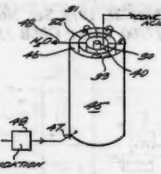
passing chromium contaminated water into the casing, between the casing and the cathode;

effecting circulation of the chromium contaminated water around the periphery of the cathode, the water passing

through the cathode into operative association with the membrane;

supplying DC current to the anode and cathode to effect concentration of the hexavalent chromium from the chromium contaminated water in the chamber within the membrane; and

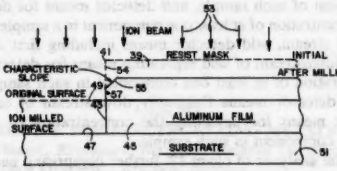
withdrawing relatively pure water from the casing and withdrawing concentrated chromic acid from the chamber within the membrane block.



4,326,936
REPEATABLE METHOD FOR SLOPING WALLS OF THIN FILM MATERIAL

Addison B. Jones, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 14, 1980, Ser. No. 195,957
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 E **1 Claim**



1. The method of sloping walls of a thin film material on a substrate, which sloping is repeatable for the same material, comprising the steps of:

laying down a metallization resist mask of known material and thickness over the thin film material;

patterning the resist;

impinging ions at normal incidence against the thin film material and resist to slope the resist walls toward the thin film material by removing resist material;

predetermining the time interval required to slope said resist to said thin film material and said thin film material to said substrate;

continuing the ion impingement until the desired slope of thin film material to substrate is attained; and,

said predetermining of said time interval being determined in accordance with:

$$t_f = t_m + X\frac{\text{Cos}\theta_p}{R_{\theta_p}} \text{ and } X = t_f R_0,$$

where

t_f=milling time in minutes

X=thickness of thin film material in Å

cos θ_p=cosine of the peak milling rate angle for the thin film material

R_{θ_p}=the milling rate at peak milling rate angle for the thin film material in Å/min

$$t_m = X_r\frac{\cos\theta_p{}'}{R'_{\theta_p}}$$

X_r=thickness of resist mask in Å

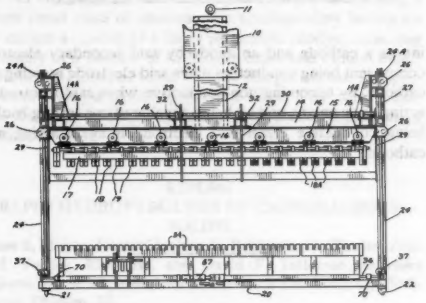
cos $\theta_p{}'$—cosine of the peak milling rate angle for the resist material

$R_{\theta_p}{}'$=the milling rate in Å/min. at peak milling rate angle for the resist material.

4,326,937
GRAB MECHANISM

Karl E. Neumeier, Stillwater, and Robert J. Sullivan, Crystal, both of Minn., assignors to PaR Systems Corp., St. Paul, Minn.

Filed Sep. 16, 1980, Ser. No. 187,750
Int. Cl.³ C25C 7/00, 7/06
U.S. Cl. 204—198 **15 Claims**



1. A grab mechanism device for transporting a plurality of generally vertically oriented plates having lift lugs and which plates are supported in a holding container having a fixed positioning member mounted thereon comprising:

a load frame having a horizontal portion;

an aligner frame having a horizontal portion and a vertical portion, said horizontal portion having guide means for engaging the fixed positioning member and thereby mechanically aligning said aligner frame with said holding container, and said vertical portion being slidably mounted relative to said load frame;

a grab frame carried by said horizontal portion of said load frame and having grab means sized to engage the lift lugs of at least one of said plates, said grab means being controlled to selectively engage said lift lugs; and

means to permit lifting said load frame relative to said container.

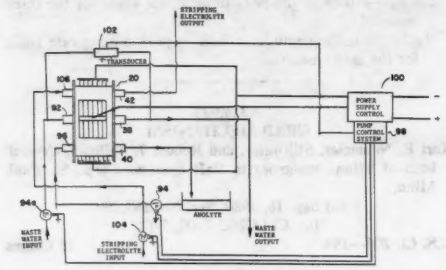
4,326,938
PLANAR CARBON FIBER ELECTRODE STRUCTURE

Sankar Das Gupta; James K. Jacobs, and Samaresh Mohanta, all of Toronto, Canada, assignors to HSA Reactors Limited, Canada

Filed Dec. 3, 1979, Ser. No. 99,522
Claims priority, application Canada, Apr. 12, 1978, 317327
Int. Cl.³ C25B 11/02; C02F 1/46; H01M 4/00
U.S. Cl. 204—228 **32 Claims**

1. An electrode comprising a secondary electrode component including a surface comprising a metal selected from the group consisting of titanium, tantalum, tungsten, niobium, hafnium, and alloys thereof, said secondary electrode component including a plurality of holes therethrough so as to permit a flow of electrolyte therethrough, electrical contact means in electrical contact with said secondary electrode component so

that outside electrical contact to said electrode is made through said secondary electrode component, a primary electrode component comprising a porous conductive material in electrical contact with said secondary electrode component, whereby said electrode is capable of alternating between acting as a cathode and an anode by said secondary electrode component being conductive when said electrode is acting as a cathode, by becoming non-conductive when said electrode is acting as an anode, and by being capable of converting back to being conductive when said electrode is again acting as a cathode.



4,326,939

ANODE SUPPORT SYSTEM FOR A MOLTEN SALT ELECTROLYTIC CELL

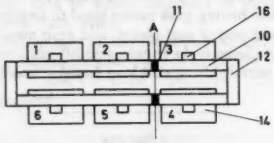
Wolfgang Schmidt-Hatting, Rüti/ZH, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Nov. 20, 1980, Ser. No. 208,697

Claims priority, application Switzerland, Dec. 3, 1979, 10704/79; Sep. 12, 1980, 6865/80

Int. Cl.³ C25C *7/02, 3/12, 3/16*

U.S. Cl. 204—228 **8 Claims**



1. An anode support system for supplying direct current to a molten salt electrolytic cell wherein a fraction of the total current supplied is fed to each end of the anode support system comprising at least two horizontal anode beams for supporting a plurality of anodes, at least two conductor plates for joining the ends of said at least two horizontal anode beams and at least two insulated joints provided at a location in said anode support system such that said anodes draw their normal current from the fraction supplied to each end of the anode support system whereby the metal wave in the cell is reduced without increasing the interpolar distance between the metal wave and the above lying anode.

4,326,940

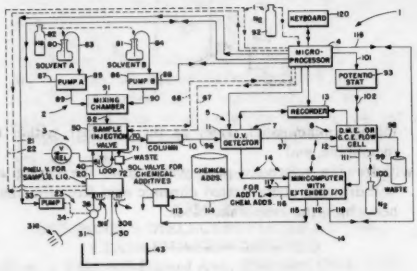
AUTOMATIC ANALYZER AND CONTROL SYSTEM FOR ELECTROPLATING BATHS

William E. Eckles; Craig V. Bishop, and Peter T. Vaitekunas, all of Cleveland, Ohio, assignors to ROHCO Incorporated, Cleveland, Ohio

Filed May 21, 1979, Ser. No. 40,505

Int. Cl.³ C25D *17/00, 21/14;* **G05B** *15/00;* **G01N** *35/00*

U.S. Cl. 204—232 **29 Claims**



17. An on-stream analyzer for electroplating baths, comprising supply means for supplying a plurality of streams of liquid, at least one from each of plural baths, selecting means for selecting one stream of liquid at a time from said supply means for analysis, separating means for passing such sample therethrough while retarding the passage of at least one of the components of such sample relative to passage of another component of such sample, and detector means for detecting the concentration of at least one component in a sample of such selected stream, said detector means including first detector means downstream of said separating means for detecting the concentration of at least one component in such sample, and second detector means fluidically downstream of said first detector means for detecting the concentration of at least another component in such sample.

27. The analyzer of claim 17, further comprising parameter control means responsive to the concentration information detected by said detector means for controlling a parameter of the bath from which the analyzed sample was derived.

4,326,941

ELECTROLYTIC CELL

Sture Westerlund, Sundsvall, Sweden, assignor to KemaNord AB, Stockholm, Sweden

Filed Jun. 23, 1980, Ser. No. 162,258

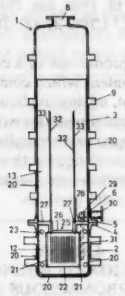
Claims priority, application Sweden, Jun. 27, 1979, 7905619

Int. Cl.³ C25B *9/00*

U.S. Cl. 204—268 **10 Claims**

1. An electrolytic cell, including a cell housing with side walls, bottom and top, two terminal electrodes, each having a vertical base plate, one side of which having electrical connections and the other side of which being provided with a number of vertical electrode plates extending essentially at right angles to the base plate, said two terminal electrodes being arranged in the cell housing with their base plates parallel and with their electrode plates at right angles thereto, at least one bipolar electrode having a vertical base plate, both sides of which having a plurality of vertical electrode plates extending outwardly at essentially right angles to the base plate, each bipolar electrode being arranged in the cell housing between said terminal electrodes and with the base plates of each bipolar electrodes parallel with the base plates of the terminal electrodes, and being positioned in such a manner that the electrode plates of adjacent electrodes are interleaved between each other to form between the base plates a number of serially connected individual cell units, partition walls extending out-

wardly from the base plates of the bipolar electrodes in the same plate thereof in a sealing manner and extending to the bottom and sides of the housing as well as upwardly towards the top of the housing, whereby a free space is present between the bottom of the housing and the electrode plates, a free space is present at least between one of the sides of the housing and

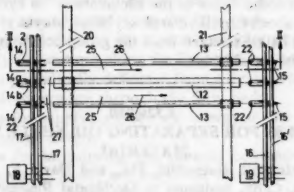


the electrode plates and a free space is present in the housing above the electrode plates, which latter space above is larger than said other free spaces and a plurality of spacers extending between the partition walls and being attached to the partition walls for fixation of the partition walls and the base plates in parallel arrangement and at a stable mutual distance.

4,326,942
DEVICE FOR ELECTROLYZING METALS

René Winand, Rixensart, Belgium, assignor to "Metallurgie Hoboken - Overpelt", Brussels, Belgium

Filed Jul. 1, 1980, Ser. No. 165,094
Claims priority, application Luxembourg, Jul. 2, 1979, 81446
Int. Cl.³ C25C *7/00, 7/02*
U.S. Cl. 204—275 **10 Claims**

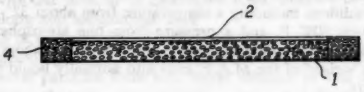


1. An apparatus for electrolyzing and electrorefining metals under high current density, said device comprising an electrolysis cell inside of which is mounted at least one pair of electrode plates in substantially parallel spaced relationship forming a channel therebetween, one of said plates being connected to an anodic current supply said electrodes thereby forming an anode-cathode unit; said cell further having an inlet and an outlet pipe with an electrolytic flow therein; said cell further comprising guide means provided within the electrolytic flow upstream to the electrodes, said guide means and electrodes being movable relative to one another in such a manner as to maintain the guide means as an extension of the surface of said electrodes, so as to generally extend the channel formed therebetween.

4,326,943
ELECTRODE IN WATER ELECTROLYSIS

Robert Bänziger, Wettinghen; Roland Isenschmid, Veltheim; Anton Menth, Nussbaumen; René Müller, Fislisbach, and Samuel Stucki, Baden, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jun. 25, 1980, Ser. No. 162,955
Claims priority, application Switzerland, Jun. 29, 1979, 6083/79
Int. Cl.³ C25B *11/02, 11/08, 11/10, 1/00*
U.S. Cl. 204—290 F **8 Claims**



1. An electrode for the electrolysis of water comprising a porous sinter plate of titanium or a titanium alloy having on one surface a coating of a finely particulate catalyst consisting essentially of a mixture of ruthenium oxide and iridium oxide; wherein said electrode has at its outer margin a dense, non-porous zone having a smooth appearance wherein the pores in said zone are filled by impregnation with a suitable impregnating substance.

4,326,944
RAPID HYDROPYROLYSIS OF CARBONACEOUS SOLIDS

James S. Meyer, Naperville; Ken K. Robinson, St. Charles; John M. Forgac, Elmhurst, and David F. Tatterson, Downers Grove, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 14, 1980, Ser. No. 140,171
Int. Cl.³ C10G *1/06*
U.S. Cl. 208—8 R **22 Claims**

1. A process for treating crushed solid carbonaceous material to obtain therefrom liquid and gaseous products, comprising:

subjecting the carbonaceous material in a stream of carrier gas to a first pressure in the range of from about 1 atmosphere to about 680 atmospheres, at a first temperature of from about ambient up to the decomposition temperature of the carbonaceous material, the carbonaceous material having a particle size in the range of from about 1 micron up to about 1 millimeter in the largest dimension;

reducing substantially in a single step the pressure on the stream of carbonaceous material from the first pressure to a second pressure in the range of from about sub-atmospheric to about 272 atmospheres, the ratio of the first pressure to the second pressure being at least about 1.6, thereby accelerating the carrier gas in the stream of carbonaceous material to at least a sonic velocity;

permitting the accelerated stream of carbonaceous material to expand as a free jet and mixing hot gas with the accelerated and expanded stream of carbonaceous material to raise the temperature of the carbonaceous material by heat exchange with the hot gas, to a second temperature in the range of the decomposition temperature to about 2204° C., and thereby initiating decomposition of the carbonaceous material to form a reaction mixture containing liquids and gases; and

reducing the temperature of the reaction mixture to below the decomposition temperature, with the total time for heating the carbonaceous material from the first temperature to the second temperature, decomposing the carbonaceous material and cooling the reaction mixture to below the decomposition temperature being in the range of from about 1 millisecond to about 10 seconds.

4,326,945
COAL LIQUEFACTION PROCESS

John F. Flagg, East Sandwich, Mass.; Russell W. Johnson, Villa Park, and John G. Gatsis, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

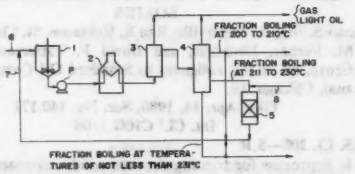
Filed Oct. 8, 1980, Ser. No. 195,047
Int. Cl.³ C10G 1/00
U.S. Cl. 208—8 LE 16 Claims

1. A process for the liquefaction of coal which comprises:
(a) subjecting coal particles to electromagnetic wave energy artificially externally supplied and having wavelengths of from about 0.001 to about 100 Å; and
(b) subjecting the resulting coal particles to coal liquefaction conditions including a temperature from about 32° F. to about 900° F. and a pressure from one atmosphere to about 10,000 psig sufficient to convert at least about 50% by weight of the M.A.F. coal into normally liquid products.

4,326,946
PROCESS FOR MANUFACTURE OF SOLVENT FOR COAL LIQUEFACTION

Tsukasa Chikata; Yoshihiko Sunami; Keiichi Sasaki, and Kunihiko Nishioka, all of Amagasaki, Japan, assignors to Sumitomo Metal Industries Ltd., Osaka, Japan

Filed Jun. 9, 1980, Ser. No. 157,837
Claims priority, application Japan, Jun. 12, 1979, 54-74441; Feb. 21, 1980, 55-21277
Int. Cl.³ C10G 7/00, 1/04
U.S. Cl. 208—93 2 Claims


GAS
LIGHT OIL
FRACTION BOILING AT 200 TO 210°C
FRACTION BOILING AT 211 TO 230°C
FRACTION BOILING AT TEMPERATURES OF NOT LESS THAN 231°C

1. A process for the production of a solvent for use in the liquefaction of coal comprising the steps of (a) substantially separating the liquid product of coal liquefaction into a first fraction boiling at 200° to 210° C., a second fraction boiling at 211° to 230° C. and a third fraction boiling at temperatures of not less than 231° C., subjecting said second fraction to a hydrogenation treatment, (c) mixing the product of the hydrogenation treatment with at least part of said first fraction to form a resultant mixture, and (d) mixing not less than 50% of said resultant mixture from step (c) with not more than 50% of said third fraction to form the solvent.

4,326,947
HYDROCRACKING OVER ALUMINA-ALUMINUM FLUOROPHOSPHATE-CONTAINING CATALYSTS

Willard H. Sawyer, Baton Rouge, and Neville L. Cull, Baker, both of La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 66,940, Aug. 16, 1979, Pat. No. 4,277,373. This application Dec. 8, 1980, Ser. No. 213,921
Int. Cl.³ C10G 45/12, 47/08
U.S. Cl. 208—111 14 Claims

1. A hydroprocessing process which comprises contacting a hydrocarbonaceous feedstock in the presence of hydrogen at hydroprocessing conditions with a catalyst comprising a hydrogenation component selected from the group consisting of Group VIB metal component, Group VIII metal component and mixtures thereof of the Periodic Table of Elements, composited with an ultrastable Y-type crystalline aluminosilicate zeolite having a unit cell size less than 24.5 Angstroms, and an alumina-aluminum fluorophosphate, said ultrastable Y-type crystalline aluminosilicate being substantially free of rare earth metals.

4,326,948
COAL LIQUEFACTION

Hyung K. Zang, Hopewell Junction, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Aug. 18, 1980, Ser. No. 179,377
Int. Cl.³ C10G 21/00, 29/20
U.S. Cl. 208—177 10 Claims

1. A process for the production of a coal liquefaction product of reduced solids content which comprises subjecting coal to liquefaction treatment, mixing the liquefaction zone effluent containing undissolved solid particles with water and a hydrocarbon separation promoter and separating the mixture into an upper layer containing coal liquefaction product and separation promoter, an intermediate aqueous layer and a lower layer containing undissolved solid particles.

4,326,949
OXYGEN ALKYLATION OF PHENOL-CONTAINING HYDROCARBONACEOUS STREAMS

Richard H. Schlosberg, New Providence, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 24, 1980, Ser. No. 200,515
Int. Cl.³ C07C 37/68; C10G 17/00
U.S. Cl. 208—263 38 Claims

20. A method for separating phenols from a phenol-containing hydrocarbonaceous stream and converting the phenols to ethers, the method which comprises:
(a) contacting the phenol-containing stream with one or more oxides and/or hydroxides of multivalent metals capable of forming hydroxy metal phenates with the phenols of the stream, and wherein the contacting is performed at temperatures lower than the decomposition temperature of the hydroxy metal phenates;
(b) separating the hydroxy metal phenates from the stream; and
(c) reacting the hydroxy metal phenates with a quaternary compound represented by the formula $R_3R'MOR''$ or $R_3R'MX$ where each R is the same or different group selected from the C_1 to about C_{20} alkyl, aryl, acyl, arylalkyl, alkylaryl, ether and ester groups, sulfide, amine and heteroatoms of silicon, selenium or a metal selected from Groups I and II of the Periodic Table of the Elements; R' is a C_1 to C_4 alkyl group; M is selected from Group VA of the Periodic Table of the Elements; R'' is hydrogen, or a C_1 to about C_{20} alkyl, aryl, arylalkyl, alkylaryl group; and X is a halide selected from the group consisting of iodine, bromine or chlorine.

4,326,950
PROCESS FOR SEPARATING OIL SHALE WASTE MATERIAL

Brij M. Moudgil, Gainsville, Fla., and David F. Messenger, Pomona, Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 897,739, Apr. 19, 1978, Pat. No. 4,169,045. This application May 7, 1979, Ser. No. 36,637
The portion of the term of this patent subsequent to Sep. 25, 1996, has been disclaimed.
Int. Cl.³ B07C 5/02
U.S. Cl. 209—3.3 10 Claims

1. A process for the separation of oil shale from a run of mine (ROM) oil shale containing particles of oil shale and refuse, the process comprising the steps of:
(a) conditioning the ROM oil shale by contacting the ROM oil shale with a coupling agent capable of selectively coating the carbonaceous matter in the particulate oil shale to the substantial exclusion of coating refuse, which coupling agent comprises at least one alcohol containing

from about 6 to about 22 carbon atoms, and at least one member selected from the group consisting of a ketone and a carboxylic acid containing from about 5 to about 28 carbon atoms;

(b) combining a coloring agent with the coating of coupling agent in a quantity sufficient to make the coated oil shale particles distinguishable from the substantially non-coated refuse particles; and

(c) separating coloring agent and coupling agent coated oil shale particles from substantially non-coloring-agent and non-coupling-agent coated refuse particles.

4,326,951

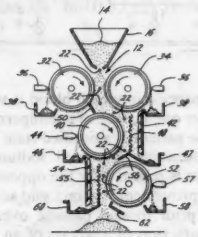
ELECTROSTATIC MINERAL CONCENTRATOR

Frank J. Broz, 8204 Easter Cove, Austin, Tex. 78758

Filed Mar. 17, 1980, Ser. No. 131,007

Int. Cl.³ B03C 7/10

U.S. Cl. 209—127 R **5 Claims**



1. Apparatus for electrostatically concentrating non-magnetic mineral particles comprising:

(a) at least one pair of oppositely charged collector electrodes spaced apart from each other and oriented so that a flow path is formed between them where material containing non-magnetic mineral particles can fall by gravity through at least a major portion of the flow path and the non-magnetic mineral particles will be charged and attracted to the electrodes, the collector electrodes each including a collector surface formed of dielectric material which together define at least a substantial portion of the flow path;

(b) ionizing means located midway between the collector electrodes for charging mineral particles at a plurality of locations spaced apart along the flow path;

(c) means for deflecting the mineral particles provided at a plurality of locations along the flow path so that the particles are periodically deflected from a straight-line path as they fall by gravity through the flow path;

(d) means for supplying electrical energy to the electrodes and ionizing means;

(e) means for introducing the material containing mineral particles at an upper portion of the flow path;

(f) means for removing collected particles from the collector electrodes; and

(g) the flow path including a first stage defined between a pair of revolving collector electrode drums spaced apart from each other, and a plurality of succeeding stages each defined between a revolving collector electrode drum on one side and a vertical plate on the other side.

4,326,952

PRECIOUS METAL RECOVERY APPARATUS

Gene J. Blake, 635 S. Cleveland, Arlington Heights, Ill. 60005

Filed Jun. 30, 1980, Ser. No. 164,232

Int. Cl.³ B01D 21/08

U.S. Cl. 210—85 **11 Claims**

10. An apparatus for recovering precious metal particles from a liquid mixture environment in a vacuum evacuation system, said apparatus comprising:

apparatus enclosure means defining a sealed chamber into which said liquid mixture flows;

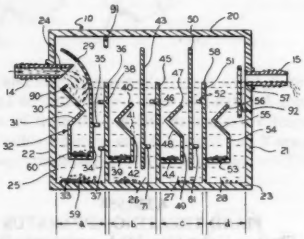
mixture input means at a first end of said chamber for directing said liquid mixture into said apparatus enclosure means;

a plurality of baffled compartment means operably disposed within said sealed chamber arranged in succession along the longitudinal axis of said apparatus enclosure means;

each of said plurality of baffled compartment means spanning the width of said enclosure means and cooperating with one another to describe a liquid mixture flow path along said longitudinal axis;

each of said plurality of baffled compartment means further including means for jogging and skimming said precious metal particles from said liquid mixture as said mixture flows through said apparatus along said flow path to promote the segregation and settling of said particles from said liquid to one or more desired regions within said sealed chamber;

flow output means at a second end of said chamber opposite



said first end for directing segregated liquid, devoid of its precious metal particles from said sealed chamber for disposal thereof as directed by said vacuum in said evacuation system;

one or more of said plurality of baffle compartment means comprising a substantially U-shaped particle entrapment region into which said liquid mixture is introduced;

an elevated standard under which said liquid mixture passes as it proceeds along said mixture flow path towards the U-shaped particle entrapment area of the next succeeding compartment;

skimming standard means over which said fluid mixture cascades to further ferret and segregate said particles of precious metal from said liquid mixture as it flows along said mixture flow path;

said skimming means further including a returning throat portion proximate to the upper portion of one or more of said U-shaped entrapment regions for more effectively accumulating particles within the entrapment region itself;

said throat returning inwardly to restrict the opening into said U-shaped region and turning outwardly thereafter to permit renewed flow of said liquid mixture along said flow path.

4,326,953

DEVICE FOR REMOVING CONTAMINATING PARTICLES FROM LUBRICATING OIL

Richard A. Gibby, 37 Willshire Dr., Tinton Falls, N.J. 07224, and Stanley B. Potter, 4 Ellen Ct., Wayside, N.J. 07712

Filed May 27, 1980, Ser. No. 153,087

Int. Cl.³ F01M 1/10

U.S. Cl. 210—168 **11 Claims**

1. A device for removing contaminating particles from lubricating oil in the lubricating system of a machine having a circulating oil line comprising:

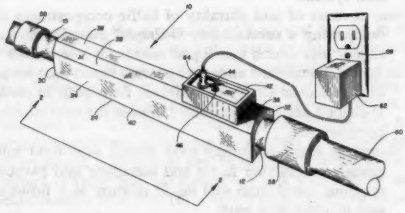
(a) a pressure tight casing forming an upper active chamber and a lower quiescent chamber;
(b) a foraminous partition between said chambers having a plurality of vertically extending passageways communicating at their upper ends with the active chamber and at their lower ends with said quiescent chamber;
(c) an oil pipe in said active chamber having an exposed inlet end and an exposed outlet end adapted to be secured in the oil line of said machine;
(d) means between said ends reducing the cross-section of the passageway through said pipe;
(e) inlet means for passing oil from said pipe upstream from said cross-section reducing means horizontally into said chamber;
(f) outlet means for passing oil into said pipe downstream from said cross-section reducing means after removal horizontally from said chamber;
(g) said active chamber providing an unobstructed path for horizontal laminar flow of oil from said inlet means to said outlet means; and
(h) means for selectively withdrawing particle-laden oil from said quiescent chamber.

4,326,954

FLUID TREATING APPARATUS

Larry L. Shroyer, Unjon City, Mich., assignor to Ener-Tec, Inc., Orland, Ind.

Filed Dec. 26, 1979, Ser. No. 107,053
Int. Cl.³ C02F *1/46*; B01D *35/06*
U.S. Cl. 210—222 **6 Claims**



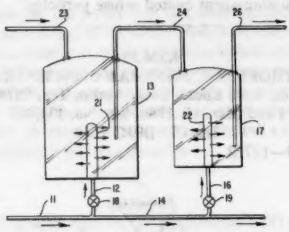
1. A fluid treating apparatus comprising an elongated tube of non-magnetic material having opposite ends and an interior passageway, said passageway extending between said opposite tube ends and being totally free of obstructions and restrictions to fluid flow therethrough, an insulated magnet wire wound around said tube into a closely packed and multilayered helical winding extending from adjacent to one of said tube ends to adjacent to the other of said tube ends, a protective covering of electrically insulating material extending over said winding and a portion of said tube on both sides of said winding between said winding and said one and other tube ends, respectively, a voltage source connector embedded in said insulating material, said connector being connected across the opposite ends of said wire, said protective covering encapsulating the connections between said voltage source connector and said wire, an AC/DC rectifier having a connector attached thereto,—said rectifier connector being joined in electrical communication with said voltage source connector, said rectifier being adapted to be connected to an AC voltage source.

4,326,955

HEMODIALYSIS WITH SODIUM BICARBONATE DIALYSATE PREPARED IN PLURAL STAGES

Albert L. Babb, and Belding H. Scribner, both of Seattle, Wash., assignors to Diachem, Inc., Arlington Heights, Ill.

Continuation-in-part of Ser. No. 48,575, Jun. 14, 1979, abandoned. This application Nov. 24, 1980, Ser. No. 209,742
Int. Cl.³ B01D *13/00*
U.S. Cl. 210—638 **11 Claims**



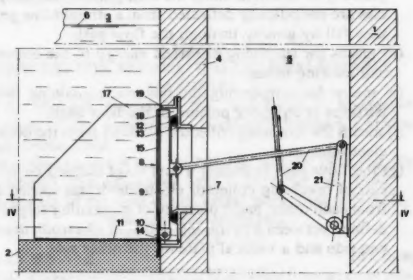
1. In a dialysis process in which blood is withdrawn from a patient, passed over one surface of a semipermeable membrane and returned to the patient in a purified state while an aqueous dialysate fluid containing dissolved sodium salts including sodium bicarbonate is passed over the opposite surface of said membrane, the improvement wherein said sodium bicarbonate is generated just prior to said passage over said membrane surface by the interaction of a stream of an aqueous solution containing dissolved sodium carbonate and a stream of an aqueous solution containing a dissolved acid of the group consisting of hydrochloric acid, acetic acid and mixtures thereof, said streams interacting in a first stage in which a stoichiometric excess of acid is provided and in at least one additional stage in which additional aqueous sodium carbonate solution is provided.

4,326,956

BACKWASHABLE FILTER SYSTEM

Otto Muller, Zurich, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 6, 1980, Ser. No. 194,478
Claims priority, application Switzerland, Nov. 5, 1979, 9900/79
Int. Cl.³ B01D *23/24*
U.S. Cl. 210—277 **8 Claims**



1. A backwashable filter system comprising
a basin defining an excess head chamber and a sludge water discharge channel and having a wall separating said excess head chamber from said channel and an opening in said wall between said chamber and said channel;
at least one granular filter bed in said basin below said cham-

ber, said bed having an upper surface in a plane below said opening;

a valve selectively closing said opening, said valve having a lid pivotally mounted on an axis extending at least substantially in said plane and along a bottom of said lid for pivoting between a position within said wall near said excess head chamber and in front of said opening and a position spaced from said wall; and

means for sealing said lid laterally relative to said wall during movement of said lid from said opening to prevent lateral outflow of sludge water.

4,326,957

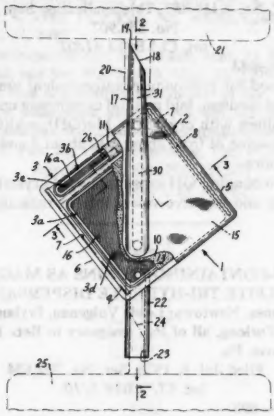
VENTED FILTER SPIGOT FOR INTRAVENOUS LIQUID ADMINISTRATION APPARATUS

David J. Rosenberg, Glen Cove, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 926,766, Jul. 21, 1978, Pat. No. 4,177,149. This application Feb. 2, 1979, Ser. No. 8,659

Int. Cl.³ B01D *35/02, 19/00*

U.S. Cl. 210—436 **12 Claims**



1. A vented filter spigot for gravity feed intravenous liquid administration, comprising a filter spigot housing; a filter chamber in the housing; an inlet and an outlet in the housing, the housing being arranged to have the inlet oriented up and the outlet oriented down when installed for liquid feed from a liquid supply for intravenous administration; the inlet being shaped for attachment to a supply of liquid in a rigid-walled container for intravaneous administration, and the outlet being shaped for attachment to an intravenous liquid administration apparatus; a liquid-permeable filter that is gas-impermeable when filled with liquid disposed in the filter chamber in a manner so as to extend generally vertically when the inlet is oriented up, and across the line of fluid flow through the chamber from the inlet to the outlet so that all through flow must pass through the filter; and dividing the chamber into two generally vertically-extending portions, one upstream and one downstream of the filter; a vent in an uppermost portion of the housing when the inlet is oriented up in flow communication with the upstream portion of the filter chamber; and a liquid-impermeable gas-permeable filter disposed across the line of flow through the vent, so that all vent flow must pass through the filter, the filter restricting such flow to gas to which it is permeable; first and second passages in the housing putting the inlet into fluid flow communication with the filter chamber, the first passage opening into an upper part of the upstream portion of the filter chamber, and the second passage being longer than the first and opening into a lower part of the upstream portion of the filter chamber; whereby outflow of liquid via the filter chamber through the outlet aspirates air via the vent, liquid-impermeable gas-permeable filter and first passage into the container holding the supply of liquid, and makes it possible to maintain liquid flow from the container via the second passage to the outlet.

4,326,958

PERMSELECTIVE MEMBRANE

Hiroshi Kawahara, and Tetsuro Yasuda, both of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

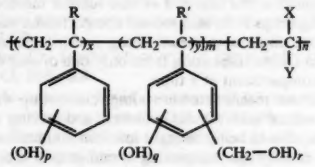
Filed Aug. 4, 1980, Ser. No. 174,563

Claims priority, application Japan, Aug. 22, 1979, 54/105973

Int. Cl.³ B01D *31/00*

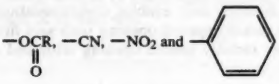
U.S. Cl. 210—500.2 **10 Claims**

1. A permselective membrane which is obtained by fabricating and crosslinking a methylolated vinylphenol polymer having repeat units having the formula



(I)

wherein p, q and r are respectively 1 or 2; x and y are respectively selected so as to give a ratio of methylol groups/hydroxy groups of from 0.01 to 2.0; m and n are respectively integers to provide $1 \geqq m/m+n \geqq 0.2$; and X and Y are selected from the group consisting of —R″, —Cl, —Br, —CO_2R″,



so as to copolymerize a vinyl monomer $CH_2{=}CXY$ with a vinylphenol; and R, R′ and R″ represent hydrogen atom or a C_1-C_4 alkyl group.

4,326,959

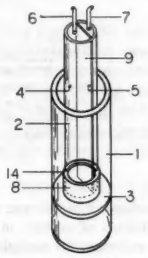
BLOOD SEPARATOR AND DISPENSER

Louis T. Ferrara, 2988 Ave. T, Brooklyn, N.Y. 11229

Filed Feb. 4, 1981, Ser. No. 231,490

Int. Cl.³ B01D *21/26*

U.S. Cl. 210—515 **4 Claims**



1. A blood separating device adapted for use with a blood centrifuge tube, said blood separating device comprising:

an elongated rotatable tubular member having a first open end and second end, said second end being closed except for two radially spaced openings, said tubular member having an outer diameter less than the inner diameter of said blood centrifuge tube; partitioning means to longitu-

dinally partition said tubular member into a first compartment and a second compartment, one of said radially spaced opening in said second end communicating with said first compartment, and the other radially spaced opening in said second end communicating with said second compartment;

First vent means located on the circumferential wall of the tubular member and communicating with said first compartment, for venting air therefrom;

second vent means located on the circumferential wall and diametrically opposed from said first vent means, and communicating with said second compartment, for venting air therefrom,

first dispensing means communicating with said first compartment at the first end of said tubular member, for dispensing drops from said first compartment;

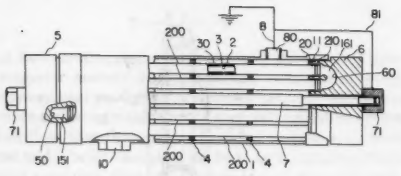
second dispensing means communicating with said second compartment at the first end of said tubular member, for dispensing drops from said second compartment, said first and second dispensing means being constructed and arranged to enable dispensing from only one of said first or second compartment at a time;

resilient element means fitted in sealing relationship with the second end of said tubular member, and having a first orifice capable of being brought into communication with said one radially spaced opening in said second end, and a second orifice capable of being brought into communication with said other radially spaced opening in said second end, said resilient element means comprising flange means constructed and arranged to sealingly engage with the inner wall of said blood centrifuge tube, said tubular member further comprising a circumferential groove, said resilient means further comprising a notch cooperating with said circumferential groove such that rotation of said tubular member only enables communications of either said one radially spaced opening with said first orifice or said other radially spaced opening with said second orifice.

4,326,960
TUBULAR PERMSELECTIVE MEMBRANE MODULE AND METHOD

Hiroshi Iwahori, and Shigetoshi Matsumoto, both of Ibaraki, Japan, assignors to Nitto Electric Industrial Company Ltd., Osaka, Japan

Filed Aug. 14, 1980, Ser. No. 177,843
Claims priority, application Japan, Aug. 14, 1979, 54-103780
Int. Cl.³ B01D *13/00, 31/00*
U.S. Cl. 210—650 **16 Claims**



1. A tubular permselective membrane module for use in the concentration of solutions of solutes in non-conductive and inflammable organic solvents, the module of which comprises:

(1) a membrane assembly, said membrane being resistant to said organic solvents and being a reverse osmosis membrane, an ultrafiltration membrane or a microfiltration membrane,

(2) an electrically conductive support tube supporting said membrane assembly therein; the wall of said support tube being constructed with spaced perforations,

(3) an electrically conductive cylindrical case enclosing said support tube therein and having a permeate port,

(4) an electrically conductive spacer maintaining the space between said support tube and said case,

(5) electrically conductive headers sealing the ends of said case in a solution-tight engagement by means of packing materials; one of said headers having at least one of an entry port for feed-solution connected to one end of said support tube and an exit port for the treated solution connected to the other end of said support tube,

(6) an electrically conductive stay-bolt locking said case and said headers by means of nuts, and

(7) a grounding means for grounding said support tube through electrically conductive elements of said module.

4,326,961
MAGNESIUM ALUMINATE ANION EXCHANGERS

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 71,920, Aug. 31, 1979, Pat. No. 4,243,555, which is a division of Ser. No. 939,544, Sep. 5, 1978, Pat. No. 4,183,900, which is a division of Ser. No. 812,542, Jul. 5, 1977, Pat. No. 4,116,857. This application Sep. 4, 1980, Ser. No. 183,907
Int. Cl.³ B01J *41/02*
U.S. Cl. 210—683 **1 Claim**

1. A method for removing negative-valent ions or radicals from aqueous medium, said method comprising contacting said aqueous medium with crystalline $Mg(OH)_2 \cdot nAl(OH)_3 \cdot mH_2O$, where n is a value of from about 1 to about 2 and m is a value of zero or more,

thereby exchanging OH ions in the said crystalline material with the said negative-valent ions or radicals.

4,326,962
SULFUR-CONTAINING LIGNINS AS MAGNESIUM SULFITE TRI-HYDRATE DISPERSANTS

Robert L. Jones, Newtown; Lewis Volgenau, Ivyland, and Philip S. Davis, Furlong, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

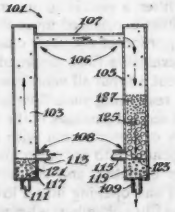
Filed Jul. 6, 1976, Ser. No. 702,634
Int. Cl.³ C02F *5/10*
U.S. Cl. 210—698 **6 Claims**

1. A method for dispersing magnesium sulfite trihydrate contained in an aqueous medium comprising adding to the medium an effective amount for the purpose as a dispersant of a lignosulfonate.

4,326,963
MULTIPLE BED FILTERING APPARATUS AND PROCESS

John D. Watson, Sr., and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 8, 1980, Ser. No. 184,680
Int. Cl.³ B01D *23/16, 23/24, 46/30*
U.S. Cl. 210—792 **10 Claims**



5. A method of filtering a solid from a fluid in a filter which

comprises at least one hollow elongated section adapted to contain a fluid; a conduit adapted to pass a fluid into and out of the section; a movable bed of filtering particles located within the section and occupying a portion of the volume of the section; a means for flowing a solids-containing fluid into the section; and a means for flowing the fluid out of the section; said method comprising:

(a) flowing a solids-containing fluid into the section and through the movable bed of filtering particles wherein at least a portion of the solids are removed and form a precipitate on the movable bed of filtering particles; and

(b) mixing substantially all of the precipitate with the movable bed of filtering particles to distribute the precipitate throughout at least a portion of the movable bed of filtering particles;

(c) forming the precepitate-filtering particle mixture into a second movable bed of filtering particles; and

(d) repeating step (a).

4,326,964
GRANULAR FILTER MEDIUM

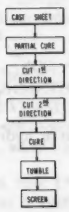
Gene Hirs, 8228 Goldie, Walled Lake, Mich. 48088

PCT No. PCT/US80/00353, § 371 Date Apr. 4, 1980, § 102(e) Date Apr. 4, 1980, PCT Pub. No. WO81/02844, PCT Pub. Date Oct. 15, 1981

Continuation-in-part of Ser. No. 23,469, Mar. 23, 1979, Pat. No. 4,197,208, and Ser. No. 23,470, Mar. 23, 1979, Pat. No. 4,197,205, which is a continuation-in-part of Ser. No. 879,296, Feb. 21, 1978, abandoned, and Ser. No. 801,702, May 31, 1977, abandoned, said Ser. No. 23,469, is a continuation-in-part of Ser. No. 879,281, Feb. 21, 1978, abandoned. This PCT application Apr. 4, 1980, Ser. No. 227,071

Int. Cl.³ B01D *23/24, 39/06*

U.S. Cl. 210—793 **7 Claims**



1. In a method of filtering contaminants from a liquid, the steps of:

flowing contaminated liquid through a deep bed filter consisting of vertically superimposed filter media layers where the uppermost layers consist of a plurality of layers of synthetic granules comprising hollow silica beads in a matrix of cured cement, said layers being superimposed in a reverse graded manner with the uppermost layer comprising the least dense particles having an effective size of approximately 0.050 inches, effective size being defined as an opening that will just pass 10% of the particles, the particles in each layer also having a uniformity coefficient of approximately 1.2 to 1.4 wherein the uniformity coefficient is defined as a number obtained by dividing the size opening which will pass 60% of the granules, if they were uniformly graded, by the sieve opening which will just pass 10% of the granules, if they were uniformly graded, these particles having a specific gravity in the range of 1.01 to about 1.40, and all of said granules being superimposed on a bottom filter media layer that is standard filter sand,

terminating the flow of contaminated liquid after the filter has become at least partially clogged by accumulated contaminants,

rejuvenating the deep bed filter by flowing backwash liquid upwards through the bed to expand all the different filter layers and to expand these layers substantially in situ but with considerable relative motion of one particle to the next to get a scrubbing action between particles so that it will facilitate the removal of accumulated contaminants,

reforming the bed with substantially distinct layers by reducing the backwash and then cutting it down entirely, so that the particles settle substantially the same as before backwash started.

4,326,965
LIQUID FABRIC-SOFTENING COMPOSITION

Alexander Lips, Birkenhead, and Stuart K. Pratley, Wirral, both of England, assignors to Levers Brothers Company, New York, N.Y.

Filed May 19, 1980, Ser. No. 150,828

Claims priority, application United Kingdom, May 21, 1979, 17532/79

Int. Cl.³ D06M *13/46, 15/16;* **C08K** *5/17;* **C08L** *5/02*

U.S. Cl. 252—8.8 **22 Claims**

1. An aqueous, liquid concentrated fabric-softening composition comprising from 25–75% by weight of an aqueous medium, from 15–60% by weight of a cationic softening agent which is a quaternary ammonium compound containing at least one C_{12}–C_{22} alkyl- or alkenyl group, said alkyl- or alkenyl group not being linked through an ester linkage, and from 4 to 25 by weight of a polymer, said polymer being water-soluble, having a viscosity (20% aqueous solution at 25° C. and 110 $sec.^{-1}$ in a Haake Viscometer) of 50 or less cP, having a vapor pressure (20% aqueous solution) equal to or lower than the vapor pressure of a 2% aqueous solution of polyethyleneglycol with a molecular weight of 6,000, said polymer having a molecular weight of at least 400.

4,326,966
AGENT FOR TEXTILE LIVENING WITH AN ANTISTATIC EFFECT AND FAVORABLE DERMATOLOGIC PROPERTIES

Jan Novak; Miloslav Sorm; Karel Ulbert; Stanislav Nespurek, all of Prague; Dagmar Mikulcova, Nove Straseci, and Jiri Cmolik, Usti n/Labem, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Jun. 12, 1980, Ser. No. 158,692

Claims priority, application Czechoslovakia, Jun. 20, 1979, 4255-79

Int. Cl.³ D06M *13/38*

U.S. Cl. 252—8.8 **2 Claims**

1. The textile livening agent with the antistatic effect and favourable dermatologic properties containing at least one additive selected from the group consisting of softening stabilizing, whitening, colouring, scenting and dermatologic additives and tensides and wherein the said agent contains 2–50 weight percent of 3-(hydroxyalkylamino)-2-hydroxypropyl esters of fatty acids of the general formula I

$$R—COO—CH_2—CH(OH)—CH_2—N(R_1R_2), \qquad I$$

where

R represents an alkyl or alkenyl group with 6–22 carbon atoms in the main chain,

R_1 is hydrogen, 2-hydroxyethyl, 3-hydroxypropyl, 1-hydroxy-2-propyl, 2-hydroxy-1-propyl, 1-hydroxy-2-butyl, 1-hydroxy-4-butyl, 1-hydroxy-3-butyl, or 2-hydroxy-3-butyl, and

R_2 represents the same substituent as R_1, except for hydrogen

the remainder to 100% by weight being water.

4,326,967

LIQUID FORMULATIONS FOR DEPOSITING PERFUMES ON FABRICS

James B. Melville, Merseyside, England, assignor to Lever Brothers Company, New York, N.Y.

PCT No. PCT/GB79/00190, § 371 Date Jun. 24, 1980, § 102(e) Date Jun. 24, 1980, PCT Pub. No. WO80/01075, PCT Pub. Date May 29, 1980
PCT Filed Nov. 16, 1979, Ser. No. 198,012
Int. Cl.³ D06M *13/10*
U.S. Cl. 252—8.8 23 Claims

1. A liquid formulation for depositing perfumes on fabric surfaces, characterised in that the formulation comprises an aqueous base having:

(i) a first dispersed phase constituting from about 0.5% to about 50% by weight of the formulation and consisting of particles having an average size of from about 0.1 micron to about 200 micron, the particles comprising an intimate mixture of (a) from about 0.5% to about 50% by weight, based on the weight of the particles, of a perfume; and (b) from about 50% to about 99.5% by weight, based on the weight of the particles of a matrix comprising at least one water dispersible amine of the formula

R—N R^1 and R^2

where R is an alkyl or alkenyl group having from 8 to 22 carbon atoms, R^1 is hydrogen or an alkyl or alkenyl group having 1 to 4 carbon atoms and R^2 is hydrogen or an alkyl, alkenyl or amino-alkyl group having from 1 to 22 carbon atoms; and

(ii) a second dispersed phase constituting from about 0.5% to about 30% by weight of the formulation and comprising a fabric conditioning agent, and in that the matrix contains no added cationic material.

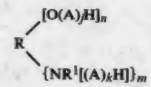
4,326,968

METHOD FOR BREAKING PETROLEUM EMULSIONS AND THE LIKE USING MICELLAR SOLUTIONS OF THIN FILM SPREADING AGENTS COMPRISING POLYEPOXIDE CONDENSATES OF RESINOUS POLYALKYLENE OXIDE ADDUCTS AND POLYETHER POLYOLS

Charles M. Blair, Jr., Buena Park, Calif., assignor to Magna Corporation, Santa Fe Springs, Calif.

Filed Oct. 5, 1979, Ser. No. 82,348
Int. Cl.³ B01D *17/04;* E21B *43/22, 43/24*
U.S. Cl. 252—8.55 D 55 Claims

1. A method for breaking petroleum emulsions of the water-in-oil type characterized by subjecting the emulsion to the action of a homogeneous micellar solution of a thin film spreading agent, said micellar solution comprising: (1) from between about 5% and about 75% by weight of a polyepoxide condensate of at least one of: (a) a polyalkylene oxide adduct of a fusible, water-insoluble organic aromatic hydrocarbon solvent-soluble synthetic resin, wherein said resin has from between about 4 to about 15 phenolic groups and is an alkyl or cycloaliphatic substituted phenol-aldehyde condensate of an ortho- or para-substituted phenol and an aldehyde, said condensate resin being thereafter further condensed with an alkylene oxide containing less than about five carbon atoms in an amount equal to at least one mole of alkylene oxide per phenolic moiety of said resin, the weight ratio of oxide to condensation product in a solvent-free state being between about 1-to-10 and about 10-to-1; and (b) a polyether polyol having the formula:



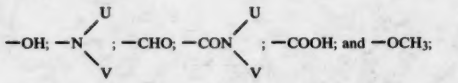
wherein:

A is an alkylene oxide group, $—C_iH_{2i}O—$;
O is oxygen;
i is a positive integer from 2 to about 10;
j is a positive integer no greater than about 100;
k is a positive integer no greater than about 100;
N is nitrogen;
R^1 is one of hydrogen, a monovalent hydrocarbon group containing less than about C_{11}, or $[A_LH]$;
L is a positive integer no greater than about 100;
R is a hydrocarbon moiety of a polyol, a primary or secondary amine, a primary or secondary polyamine, a primary or secondary amino alcohol, or hydrogen; and
m+n is no greater than about 4 when R is other than hydrogen and one of m and n is zero and the other is unity when R is hydrogen, said polyepoxide being selected from the group consisting of the diglycidyl ether of dihydroxyphenyl-methyl methane and the lower polymers thereof, diisobutenyl dioxide, polyepoxypolyglycerols, epoxidized linseed oil and epoxidized polybutadiene,

said condensate, at about 25° C.: (A) having a solubility in water and isooctane of less than about 1%, by volume; (B) having a solubility parameter from between about 6.8 and about 8.5; and (C) spreading at the interface between white, refined mineral oil and distilled water to form a film having a calculated thickness no greater than about 20 Angstroms, at a spreading pressure of about 16 dynes per cm; (2) from between about 2% and about 30% by weight of a hydrotropic agent having one of the formulas:

X—Z (A)

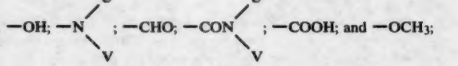
wherein X is an alkyl, alicyclic, aromatic, alkylalicyclic, alkylaryl, arylalkyl, alicyclicalkyl, heterocyclic or substituted heterocyclic radical having 2 to 13 carbon atoms; and wherein Z is one of:



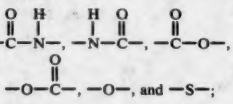
and U and V are hydrogen or hydrocarbon substituents;

$—X—Y—R—(Z)_n$, (B)

wherein:
Z is one of



X is an alkyl, alicyclic, aromatic, alkylalicyclic, alkylaryl, arylalkyl, alicyclicalkyl, heterocyclic or substituted heterocyclic radical having 2 to 12 carbon atoms;
R is a member selected from the class consisting of, $—CH_2—$, $—C_2H_4—$, $—C_3H_5=$, $—C_3H_6$, and $—C_2H_4—O—C_2H_4—$;
n is either a one or two integer, the integer dependent upon the selection of R; U and V are hydrogen or hydrocarbon substituents, and
Y is a member selected from the class consisting of:



(3) from between about 2% and about 30% by weight of an amphipathic agent having at least one radical having

from between about 10 and about 64 carbon atoms per molecule; and

(4) from between about 15% and about 90% by weight, water.

4,326,969

PROCESS FOR SECONDARY RECOVERY

Walter D. Hunter, Houston, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Continuation-in-part of Ser. No. 953,375, Oct. 23, 1978, abandoned. This application Apr. 21, 1980, Ser. No. 142,550

Int. Cl.[3] E21B *43/22, 43/25, 43/267*

U.S. Cl. 252—8.55 D 12 Claims

1. A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation penetrated by an injection well and a production well which comprises;

(a) injecting into the formation via an injection well a drive fluid comprising water having dissolved therein about 0.05 to about 5 weight percent of a material of number average molecular weight from about 10,000 to about 2,000,000 selected from the group consisting of (I) polyacrylamide and (II) partially hydrolyzed polyacrylamide or the sodium, potassium or ammonium salt thereof and from about 0.01 to about 2.0 weight percent of a substance selected from the group consisting of (III) polyacrylamide and (IV) partially hydrolyzed polyacrylamide or the sodium, potassium or ammonium salt thereof alkoxylated with about 2 to about 100 weight percent of 2,3-epoxy-1-propanol wherein in the partially hydrolyzed polyacrylamide or the sodium, potassium or ammonium salts thereof the proportion of amide containing monomers is about 33 to about 88 mole percent and the proportion of the carboxy containing monomers is about 12 to about 67 mole percent,

(b) forcing the said fluid through the formation, and

(c) recovering hydrocarbons through the production well.

4,326,970

COPOLYMERS OF N,N-DIMETHYLACRYLAMIDE AND ACRYLAMIDE

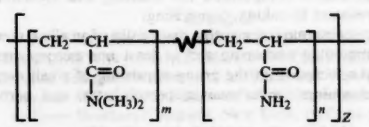
Ian W. Cottrell, Solana Beach; John K. Baird, and Jaewon L. Shim, both of San Diego, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 961,820, Nov. 17, 1978, Pat. No. 4,254,249. This application May 2, 1980, Ser. No. 146,531

Int. Cl.[3] E21B *43/22*

U.S. Cl. 252—8.55 D 5 Claims

1. In a process for recovering petroleum from a subterranean oil-bearing formation which comprises introducing into an input well penetrating said formation a viscous, aqueous fluid comprising an aqueous solution of a water-soluble organic polymer and forcing said viscous, aqueous fluid through said formation towards at least 1 output well penetrating said formation at a distance from said input well, the improvement which consists in employing as the water-soluble polymer an effective, viscosity-increasing amount of a hydrolyzed form of the copolymer of N,N-dimethylacrylamide and acrylamide of the formula:



I

where

m and n are whole numbers such that the weight:weight ratio of NNDMA to AM ranges from greater than 5:95 to about 95:5;

Z is a number such that the viscosity of the hydrolyzed copolymer is at least about 1000 cP (1% w/w solution in deionized water, Brookfield LVF viscometer, spindle 4, 60 rpm); and

~ indicates that the distribution of NNDMA and AM in the polymer chain is random

wherein the percent of hydrolysis which produces carboxyl groups ranges from about 5% to about 65%.

4,326,971

DETERGENT SOFTENER COMPOSITIONS

Harold E. Wixon, New Brunswick, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 201,168, Oct. 27, 1980, which is a continuation-in-part of Ser. No. 96,370, Nov. 21, 1979, which is a continuation-in-part of Ser. No. 968,532, Dec. 11, 1978, Pat. No. 4,230,590. This application May 1, 1981, Ser. No. 259,728

Int. Cl.[3] C11D *1/86, 3/04, 17/06;* D06M *13/48*

U.S. Cl. 252—8.75 31 Claims

1. A detergent softener composition capable of imparting improved softness, detergency, antistatic and soil antiredeposition properties to fabrics treated therewith in the wash cycle of a laundering process comprising a particulate detergent base containing from about 5 to 40% by weight relative to the composition, of a water soluble non-soap, organic surfactant, at least about 90% thereof being of the anionic type, and from about 10 to 60% by weight relative to the composition, of water soluble, neutral to alkaline builder salt; said detergent base being in admixture with discrete particles of cationic amine softener, said softener being selected from the group consisting of (a) aliphatic di(lower) (C_1–C_4) alkyl, di(higher) C_{14}–C_{24} alkyl quaternary ammonium salts (b) heterocyclic compounds, and mixtures of (a) and (b), and said detergent base being in admixture with discrete particles of a mixture of water soluble or dispersible fatty acid soap, nonionic organic surfactant and magnesium sulfate, said nonionic constituting from about 2 to about 50% by weight of the mixture, and said magnesium sulfate constituting from about 1 to 15% of the mixture, the weight ratio of soap to softener being from about 8:1 to 1:3, the percent concentration of anionic surfactant being at least about $1.5\times+5$, wherein $\times$ represents the percent concentration of softener, said softener particles comprising from about 2 to 20% by weight of the composition and being free of the soap-nonionic-magnesium sulfate mixture, said soap-nonionic-magnesium sulfate mixture particles comprising from about 2 to 20% by weight of the composition and being free of the cationic softener, and said detergent base being free of cationic softener.

8. A composition according to claim 1 wherein said softener is methyl-1-tallow amido ethyl-2-tallow-imidazolinium methyl sulfate.

4,326,972

CONCENTRATES, LUBRICANT COMPOSITIONS AND METHODS FOR IMPROVING FUEL ECONOMY OF INTERNAL COMBUSTION ENGINE

William B. Chamberlin, III, Kirtland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jun. 14, 1978, Ser. No. 915,486

Int. Cl.[2] C10M *1/40*

U.S. Cl. 252—33.3 52 Claims

1. A lubricating composition comprising:

(A) A major amount of a lubricating oil; and minor effective amounts of

(B) a composition prepared by sulfurizing, at a temperature of about 100° to about 250° C., a mixture comprising (B-1) 100 parts by weight of at least one ester of a substantially aliphatic caboxylic acid containing from about 8 to about 30 carbon atoms and a substantially aliphatic alcohol, (B-2) from about 2 to about 50 parts of at least one substantially aliphatic carboxylic acid containing from about 8 to about 30 carbon atoms, and (B-3) from about 25 to about 400 parts by weight of at least one substantially aliphatic

monoolefin containing from about 8 to about 36 carbon atoms; and

(C) at least one oil-dispersible basic alkali metal sulfonate prepared by intimately contacting for a period of time sufficient to form a stable dispersion, at a temperature between the solidification temperature of the reaction mixture and its decomposition temperature;

(C-1) at least one acidic gaseous material selected from the group consisting of carbon dioxide, hydrogen sulfide, sulfur dioxide, and mixtures thereof, with

(C-2) a reaction mixture comprising

(C-2-a) at least one oil-soluble sulfonic acid, or derivative thereof susceptible to overbasing;

(C-2-b) at least one alkali metal or basic alkali metal compound;

(C-2-c) at least one lower aliphatic alcohol; and

(C-2-d) at least one oil-soluble carboxylic acid or functional derivative thereof.

4,326,973

QUATERNARY AMMONIUM SUCCINIMIDE SALT COMPOSITION AND LUBRICATING OIL CONTAINING SAME

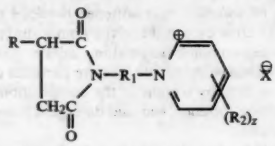
Kenneth G. Hammond, and Harry Chafetz, both of Poughkeepsie, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 13, 1981, Ser. No. 224,728

Int. Cl.³ C10M *1/32*

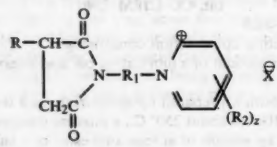
U.S. Cl. 252—34 **14 Claims**

1. A quaternary ammonium succinimide salt composition represented by the formula:



in which R is a hydrocarbyl radical having from 25 to 200 carbon atoms, R_1 is a divalent hydrocarbon radical having from 3 to 10 carbon atoms, R_2 is hydrogen or an alkyl radical having from 1 to 4 carbon atoms, z has a value from 0 to 5 and X is a halide radical.

8. A lubricating oil composition comprising a major portion of a mineral lubricating oil and a minor dispersant amount of a quaternary ammonium succinimide salt composition represented by the formula:



in which R is a hydrocarbyl radical having from 25 to 200 carbon atoms, R_1 is a divalent hydrocarbon radical having from 3–10 carbon atoms, R_2 is hydrogen or an alkyl radical having from 1 to 4 carbon atoms, z has a value from 0 to 5 and X is a halide radical.

4,326,974

OIL-IN-WATER EMULSION FOR COLD ROLLING LIGHT METALS

Rudolf Baur, Kreuzlingen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Dec. 8, 1980, Ser. No. 213,849

Claims priority, application Switzerland, Sep. 12, 1980, 6863/80

Int. Cl.³ C10M *1/06*

U.S. Cl. 252—49.5 **6 Claims**

1. In an oil-in-water emulsion for cold rolling light metals, in particular aluminum or aluminum alloys, the improvement which comprises adding a small but effective stain inhibiting amount of xylitol and sorbitol to the emulsion.

4. In an oil-in-water emulsion for cold rolling light metals, in particular aluminum and aluminum alloys, said emulsion comprising an aqueous oil-in-water emulsion rolling lubricant containing polyisobutylene as hydrodynamic film former, alkylmonocarboxylic acid esters as reaction layer former, polyethoxylated sorbitanoleates as emulsifier, unsaturated, long chain alkylmonocarboxylic acids as inhibitor to prevent hydrogen embrittlement and rusting, fungicide and bactericide, and the balance essentially deionized water, the improvement which comprises adding a small but effective stain inhibiting amount of xylitol and sorbitol to the emulsion.

4,326,975

PROCESS FOR STORING HEAT WITH A EUTECTIC COMPOSITION CONTAINING AT LEAST ONE SATURATED ALIPHATIC HYDROCARBON AND AT LEAST ONE FATTY ACID

Andre Cadet, Le Havre, France, assignor to Compagnie Francaise de Raffinage, Paris, France

Filed Jul. 8, 1980, Ser. No. 166,795

Claims priority, application France, Jul. 11, 1980, 79 17972

Int. Cl.³ C09K *5/06*

U.S. Cl. 252—70 **5 Claims**

1. A process for storing solar heat by absorption of said heat in a eutectic composition comprising at least one or a mixture of saturated aliphatic hydrocarbons and at least one fatty acid selected from the group consisting of fatty acids having at least 10 carbons atoms wherein the saturated hydrocarbon or mixture of saturated hydrocarbons has a melting point equal to or greater than 20° C. and wherein the fatty acid is selected from the group consisting of stearic acid, palmitic acid and capric acid.

4,326,976

COMPOSITION AND PROCESS FOR WASHING AND BLEACHING

William R. Logan, Ottenburg; Pierre Sarot, Vilvoorde, and Edmond Bouillet, Brussels, all of Belgium, assignors to Interox, Brussels, Belgium

Filed Apr. 17, 1979, Ser. No. 30,901

Claims priority, application France, Apr. 17, 1978, 78 11637

Int. Cl.³ C11D *7/38, 7/18*

U.S. Cl. 252—99 **15 Claims**

1. A particulate composition for washing and bleaching, which is resistant to caking, comprising:

(a) active compounds consisting essentially of an alkali metal or ammonium carbonate and at least one peroxy compound selected from the group consisting of alkali metal or ammonium percarbonates, persulphates, and perborates; and

(b) anticaking agents consisting essentially of

(1) at least one alkali metal or ammonium aryl sulphonate, and

(2) at least one water insoluble inorganic compound selected from the group consisting of compounds of magnesium and compounds derived from silica or alumina,

said anticaking agent being present in an amount between

0.01 and 40% by weight, based on the total amount of said active compounds.

4,326,977

LIQUID ANTISEPTIC CLEANERS WITH IMPROVED FOAMING PROPERTIES

Irving R. Schmolka, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 10, 1980, Ser. No. 205,115

Int. Cl.³ C11D *1/722, 3/48, 17/08*

U.S. Cl. 252—106 **12 Claims**

1. A skin cleansing composition having good foaming properties comprising an agent selected from the group consisting of parachloro meta xylenol, hexachlorophene, 2-bromo-2-nitropropane diol, salicylanilide, didecyl dimethyl ammonium chloride, cetyl dimethylethyl ammonium bromide, alkyl dimethyl benzyl ammonium chloride, alkyl dimethylethyl benzyl ammonium chloride, alkyl dimethylbenzyl ammonium succinate, alkyl dimethyl-3,4-dichlorobenzyl ammonium chloride, 3,3',4',5-tetrachlorosalicylanilide, 3',4',5-trichlorosalicylanilide, 3,5-dibromo-3'-trifluoromethylsalicylanilide, 3,4,4'-trichlorocarbamilide, benzalkonium chloride, chloramine, iodine, iodophors, chlorhexidine and salts thereof, in normal antiseptic amounts agent, a polyoxyethylene-polyoxybutylene block copolymer wherein the polyoxybutylene portion of the compound has a molecular weight of from 500 to 2000 and the polyoxyethylene portions contribute from about 60 to 90 percent by weight of the compound in an amount of from 5 to 40 percent w/v and the balance substantially water.

4,326,978

SOAP BAR WITH ANTIMICROBIAL ACTION

Boris Moesch, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

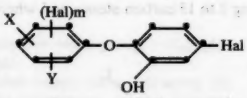
Filed Nov. 10, 1980, Ser. No. 205,823

Claims priority, application Switzerland, Nov. 16, 1979, 10253/79

Int. Cl.³ C09K *15/02;* **C11D** *9/18, 9/50, 17/00*

U.S. Cl. 252—107 **16 Claims**

1. A soap bar with antimicrobial action containing, as antimicrobial compound, a halogenated o-hydroxydiphenyl ether of the formula



(I)

wherein X is halogen, methyl, methoxy or hydroxy, Y is hydrogen, methyl or trifluoromethyl, Hal is a halogen atom and m is 0, 1 or 2, which soap bar additionally contains a water-insoluble, colorless magnesium silicate in an amount sufficient to effectively diminish discoloration of the bar on exposure to light.

4,326,979

NON-AQUEOUS, BUILT LIQUID DETERGENT COMPOSITION AND METHOD FOR PREPARING SAME

Jan Bus, Krimpen; Willem M. M. Möhlmann, Vlaardingen, and Norman J. Pritchard, Bilthoven, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Oct. 31, 1980, Ser. No. 203,076

Claims priority, application United Kingdom, Nov. 9, 1979, 38986/79

Int. Cl.³ C11D *7/06, 7/50*

U.S. Cl. 252—158 **9 Claims**

1. A non-aqueous, built liquid detergent composition consisting essentially of:

(a) from 5–45% by weight of a nonionic surface-active detergent material which is a liquid or liquefiable at room temperature;

(b) from 0.1–1% by weight of an at least 30% hydrolyzed, hydrolyzable copolymer of maleic anhydride with ethylene or vinylmethylether;

(c) from 5–60% by weight of a hydroxyl group-containing solvent, in which the partially hydrolyzed copolymer (b) shows a solubility of at least 1.5% by weight after having been dissolved at about 80° C.;

(d) from 2.5–20% by weight of an alkaline material having a mean particle size of less than 50 micrometers, and yielding a pH (1% by weight aqueous solution at 20° C.) of equal to or higher than 10; and

(e) from 1–70% by weight of a builder salt.

4,326,980

ACRYLIC COPOLYMER COMPOSITION INHIBITS SCALE FORMATION AND DISPERSES OIL IN AQUEOUS SYSTEMS

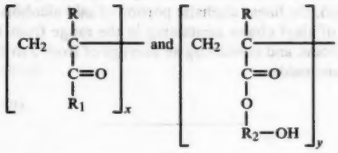
William R. Snyder, Warminster, and Diane Feuerstein, Bensalem, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Feb. 23, 1981, Ser. No. 237,178

Int. Cl.³ C02F *5/10*

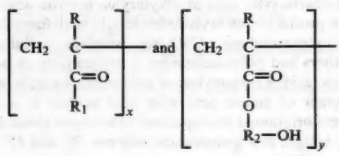
U.S. Cl. 252—180 **29 Claims**

1. Composition for treating an aqueous medium, said composition comprising an effective amount for the purpose of a water soluble polymer (I) comprising moieties (a) derived from an acrylic acid or water soluble salt thereof and moieties (b) of an hydroxylated lower alkyl acrylate, wherein the moieties of the polymer (I) have the following formula



wherein R is hydrogen or a lower alkyl of from 1 to 3 carbon atoms; R_1 is OH, OM, or NH_2 where M is a water soluble cation; R_2 is a lower alkyl of from about 2–6 carbon atoms and the molar ratio of x to y is about 34:1 to 1:4, and an effective amount of a water soluble alkyl phenoxy polyethoxyethanol compound (II) wherein the alkyl group of the alkyl phenoxy polyethoxyethanol compound has from about 6–12 carbon atoms.

6. In a method of controlling the deposition of scale imparting precipitates on the structural parts of the system exposed to an aqueous medium containing scale imparting precipitates under deposit forming conditions, said scale imparting precipitates being selected from the group consisting of calcium carbonate, calcium phosphate and calcium sulfate, which method comprises adding to said aqueous medium an effective amount for the purpose of a water soluble polymer (I) comprising moieties (a) derived from an acrylic acid or water soluble salt thereof and moieties (b) of an hydroxylated lower alkyl acrylate, wherein the moieties of the polymer have the following formula



wherein R is hydrogen or a lower alkyl of from 1 to 3 carbon atoms; R_1 is OH, OM or NH_2 where M is a water soluble cation; R_2 is a lower alkyl of from about 2–6 carbon atoms and a mole ratio of x to y is 34:1 to 1:4, the improvement comprising adding to said aqueous medium an effective amount of a water soluble alkyl phenoxy polyethoxyethanol compound (II) wherein the alkyl group of said alkyl phenoxy polyethoxyethanol compound has from about 6 to 12 carbon atoms.

4,326,981

NONSTAINING LEAK TRACER SOLUTION AND METHOD EMPLOYING SAME

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 15, 1979, Ser. No. 66,609
Int. Cl.³ C09K *11/06*
U.S. Cl. 252—301.19 **9 Claims**

1. A leak tracer solution consisting essentially of a major proportion of water, about 0.1 to about 10% by weight of a nonionic surfactant, and about 0.005 to about 1.0% by weight of a water soluble dye which is essentially non-staining on painted surfaces, and which does not migrate into or penetrate painted surfaces, said painted surfaces containing a polyurethane or epoxy resin base, said nonionic surfactant being of the group consisting of (a) straight chain, primary, aliphatic oxyalkylated alcohol, wherein said alcohols can contain from 8 to 20 carbon atoms and the oxyalkyl groups are ethylene oxide and propylene oxide groups, and (b) ethoxylates of linear secondary aliphatic alcohols, with the hydroxyl groups randomly distributed, the linear aliphatic portion of said alcohols being a mixture of alkyl chains containing in the range from 10 to 17 carbon atoms, and containing an average of from 3 to 12 moles of ethylene oxide.

4,326,982

PROCESS FOR THE MANUFACTURE OF FINE-CRYSTALLINE FLUORESCENT BRIGHTENERS OF THE BIS-TRIAZINYLAMINOSTILBENE SERIES IN THE β-CRYSTAL FORM

Konrad Neumann, Wyhlen, and Ernst Schenkenberger, Rheinfelden, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 839,693, Oct. 5, 1977, abandoned. This application Jul. 13, 1979, Ser. No. 57,543
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646273
Int. Cl.³ D06L *3/12*
U.S. Cl. 252—301.23 **3 Claims**

1. A process for the manufacture of fine-crystalline fluorescent brighteners of the bis-triazinylamino-stilbene series in the β-crystal form by grinding in an aqueous medium, which process consists essentially of mixing a water-containing fluoroescent brightener filter cake in the β- and/or α-crystal form with an aqueous organic solution of a dispersant selected from an alkali salt of an alkylsulphonic acid, alkylarylsulphonic acid, alkylcarboxylic acid or alkylarylcarboxylic acid, a condensation product of an arylsulphonic acid with formaldehyde, N-polyvinylpyrrolidone, CaO-free sulphite cellulose lye, starch ethers and polysaccharides, a carboxylate of polymerised maleic acid, a carboxylate of polymerised acrylic acid and a copolymer of maleic acid with allyl acetate in a ratio of fluorescent brightener to dispersant of between about 20:1 and 100:1 by weight at a temperature between 70° and 85° C., and grinding at this temperature.

4,326,983

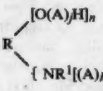
MICELLAR SOLUTIONS OF THIN FILM SPREADING AGENTS COMPRISING A POLYETHER POLYOL

Charles M. Blair, Jr., Buena Park, Calif., assignor to Magna Corporation, Santa Fe Springs, Calif.

Filed Oct. 5, 1979, Ser. No. 82,349
Int. Cl.³ B01D *17/04*; E21B *43/22*
U.S. Cl. 252—358 **52 Claims**

1. A homogeneous micellar thin film spreading agent solution, comprising:

(1) from between about 5% and about 75% by weight of a polyether polyol having the formula:



wherein:

A is an alkylene oxide group, $—C_iH_{2i}O—$;

O is oxygen;

i is a positive integer from 2 to about 10;

j is a positive integer no greater than about 100;

k is a positive integer no greater than about 100;

N is nitrogen;

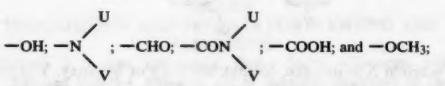
R^1 is one of hydrogen, a monovalent hydrocarbon group containing less than about C_{11}, or $[A_LH]$;

L is a positive integer no greater than about 100;

R is a hydrocarbon moiety of a polyol, a primary or secondary amine, a primary or secondary polyamine, a primary or secondary amino alcohol, or hydrogen; and

m+n is no greater than about 4 when R is other than hydrogen and one of m and n is zero and the other is unity when R is hydrogen,

said polyether polyol at about 25° C.: (a) being less than about 1% by volume soluble in water and in isooctane; (b) having a solubility parameter in the range of between about 6.9 and about 8.5; and (c) spreading at the interface between distilled water and refined mineral oil to form a film having a thickness no greater than about 20 Angstroms at a spreading pressure of about 16 dynes per cm; (2) from between about 2% and about 30% by weight of a hydrotropic agent having one of the formulas: wherein X is an alkyl, alicyclic, aromatic, alkylalicyclic, alkylaryl, alicyclicalkyl, heterocyclic or substituted heterocyclic radical having 2 to 13 carbon atoms; and wherein Z is one of:

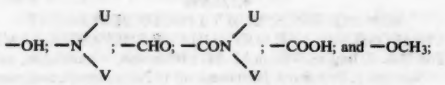


where U and V are hydrogen or hydrocarbon substituents.

(B)

wherein:

Z is one of

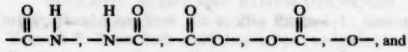


X is an alkyl, alicyclic, aromatic, alkylalicyclic, alkylaryl, arylalkyl, alicyclicalkyl, heterocyclic or substituted heterocyclic radical having 2 to 12 carbon atoms;

R is a member selected from the class consisting of, $—CH_2—$, $—C_2H_4—$, $C_3H_5=$, $—C_3H_6$, and $—C_2H_4—O—C_2H_4—$;

n is either a one or two integer, the integer dependent upon the selection of R;

Y is a member selected from the class consisting of:



and U and V are hydrogen or hydrocarbon substituents;

(3) from between about 2% and about 30% by weight of an amphipathic agent having at least one radical having from between about 10 and about 64 carbon atoms per molecule; and

(4) from between about 15% and about 90% by weight, water.

4,326,984

MICELLAR SOLUTIONS OF THIN FILM SPREADING AGENTS COMPRISING POLYEPOXIDE CONDENSATES OR RESINOUS POLYALKYLENE OXIDE ADDUCTS AND POLYETHER POLYOLS

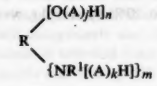
Charles M. Blair, Jr., Buena Park, Calif., assignor to Magna Corporation, Santa Fe Springs, Calif.

Filed Oct. 5, 1979, Ser. No. 82,364

Int. Cl.³ B01D *17/04;* E21B *43/22*

U.S. Cl. 252—358 **46 Claims**

1. A homogeneous thin film spreading agent solution, comprising: (1) from between about 5% to about 75% by weight of a polyepoxide condensate of at least one of: (a) a polyalkylene oxide adduct of a fusible, water-insoluble organic aromatic hydrocarbon solvent-soluble synthetic resin, wherein said resin has from between about 4 to about 15 phenolic groups and is an alkyl or cycloaliphatic substituted phenol-aldehyde condensate of an ortho- or para-substituted phenol and an aldehyde, said condensate resin being thereafter further condensed with an alkylene oxide containing less than about five carbon atoms in an amount equal to at least one mole of alkylene oxide per phenolic moiety of said resin, the weight ratio of oxide to condensation product in a solvent-free state being between about 1-to-10 and about 10-to-1; and (b) a polyether polyol having the formula:



wherein:

A is an alkylene oxide group, $-C_iH_{2i}O-$;

O is oxygen;

i is a positive integer from 2 to about 10;

j is a positive integer no greater than about 100;

k is a positive integer no greater than about 100;

N is nitrogen;

R^1 is one of hydrogen, a monovalent hydrocarbon group containing less than about C_{11}, or $[A_LH]$;

L is a positive integer no greater than about 100;

R is a hydrocarbon moietyy of a polyol, a primary or secondary amine, a primary or secondary polyamine, a primary or secondary amino alcohol, and hydrogen; and

m+n is no greater than about 4 when R is other than hydrogen and one of m and n is zero and the other is unity when R is hydrogen, said polyepoxide being selected from the group consisting of the diglycidyl ether of dihydroxyphenyl-methyl methane and the lower polymers thereof, diisobutenyl dioxide, polyepoxypolyglycerols, epoxidized linseed oil and epoxidized polybutadiene,

said condensate, at about 25° C.: (A) having a solubility in water and isooctane of less than about 1%, by volume; (B) having a solubility parameter from between about 6.8 and about 8.5; and (C) spreading at the interface between white, refined mineral oil and distilled water to form a film having a calculated thickness no greater than about 20 Angstroms, at a spreading pressure of about 16 dynes per cm; (2) from about 2% and about 30% by weight of a hydrotropic agent having one of the formulas:

(A)

wherein

X is an alkyl, alicyclic, aromatic, alkylalicyclic, alkylaryl, arylalkyl, alicyclicalkyl, heterocyclic or substituted heterocyclic radical having 2 to 13 carbon atoms; and wherein

Z is one of:

—OH;

—CHO;

—COOH; and —OCH_3;

and U and V are hydrogen or hydrocarbon substituents,

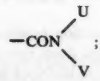
(B)

wherein:

Z is one of

—OH;

—CHO;



—COOH; and —OCH_3;

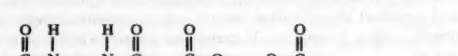
X is an alkyl, alicyclic, aromatic, alkylalicyclic, alkylaryl, arylalkyl, alicyclicalkyl, heterocyclic or substituted heterocyclic radical having 2 to 12 carbon atoms;

R is a member selected from the class consisting of,

$-CH_2-$, $-C_2H_4-$, $C_3H_5=$, $-C_3H_6-$, and $-C_2H_4-O-C_2H_4-$;

n is either a one or two integer, the integer dependent upon the selection of R;

Y is a member selected from the class consisting of:



-continued

—O—, and —S—;

—O—, and —S—;

and U and V are hydrogen or hydrocarbon substituents;
(3) from between about 2% and about 30% by weight of an amphipathic agent having at least one radical having from between about 10 and about 64 carbon atoms per molecule; and
(4) from between about 15% and about 90% by weight, water.

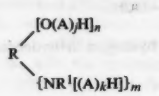
4,326,985

MICELLAR SOLUTIONS OF THIN FILM SPREADING AGENTS COMPRISING AN ACYLATED POLYETHER POLYOL

Charles M. Blair, Jr., Buena Park, Calif., assignor to Magna Corporation, Santa Fe Springs, Calif.

Filed Oct. 5, 1979, Ser. No. 82,365
Int. Cl.[3] **B01D** *17/04*
U.S. Cl. 252—358 **50 Claims**

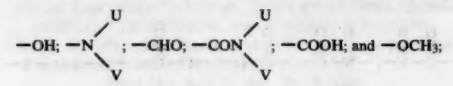
1. A homogeneous micellar thin film spreading agent solution, comprising:
(1) from between about 5% and about 75% by weight of an acylated polyether polyol having the formula:



wherein:
A is an alkylene oxide group, $—C_iH_{2i}O—$;
O is oxygen;
i is a positive integer from 2 to about 10;
j is a positive integer no greater than about 100;
k is a positive integer no greater than about 100;
N is nitrogen;
R^1 is one of hydrogen, a monovalent hydrocarbon group containing less than about C_{11}, or $[A_LH]$;
L is a positive integer no greater than about 100;
R is a hydrocarbon moiety of a polyol, a primary or secondary amine, a primary or secondary polyamine, a primary or secondary amino alcohol, or hydrogen; and
m+n is no greater than about 4 when R is other than hydrogen and one of m and n is zero and the other is unity when R is hydrogen.
said acylated polyether polyol being the reaction product of said polyether polyol and a member selected from the class consisting of mono- and polybasic carboxylic acids, acid anhydrides, and iso-, diiso-, and polyisocyanates, said acylated polyether polyol at about 25° C.: (a) being less than about 1% by volume soluble in water and in isooctane; (b) having a solubility parameter in the range of between about 6.9 and about 8.5; and (c) spreading at the interface between distilled water and refined mineral oil to form a spreading film having a thickness no greater than about 20 Angstroms at a film pressure of about 16 dynes per cm; (1) from between about 2% and about 30% by weight of a hydrotropic agent having one of the formulas:

X—Z (A)

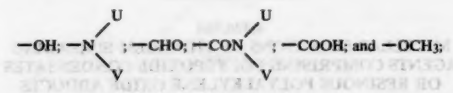
wherein X is an alkyl, alicyclic, aromatic, alkylalicyclic, alkylaryl, arylalkyl, alicyclicalkyl, heterocyclic or substituted heterocyclic radical having 2 to 13 carbon atoms; and wherein Z is one of:



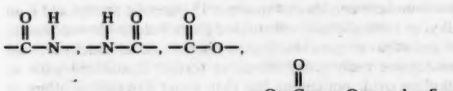
where U and V are hydrogen or hydrocarbon substituents;

X—Y—R—$(Z)_n$, (B)

wherein:
Z is one of



X is an alkyl, alicyclic, aromatic, alkylalicyclic, alkylaryl, arylalkyl, alicyclicalkyl, heterocyclic or substituted heterocyclic radical having 2 to 12 carbon atoms;
R is a member selected from the class consisting of, $—CH_2—$, $—C_2H_4—$, $C_3H_5=$, $—C_3H_6$, and $—C_2H_4—O—C_2H_4—$;
n is either a one or two integer, the integer dependent upon the selection of R;
Y is a member selected from the class consisting of:



and U and V are hydrogen or hydrocarbon substituents;
(3) from between about 2% and about 30% by weight of an amphipathic agent having at least one radical having from between about 10 and about 64 carbon atoms per molecule; and
(4) from between about 15% and about 90% by weight, water.

4,326,986

COMPOSITION AND METHOD FOR SUPPRESSING VAPOR LOSS OF VOLATILE HYDROCARBONS

Gerard P. Canevari, Cranford, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 6, 1976, Ser. No. 702,692
Int. Cl.[3] **C09K** *3/00*
U.S. Cl. 252—384 **11 Claims**

1. An evaporation retarding mixture capable of forming a continuous stable film over the surface of a liquid hydrocarbon body consisting essentially of: a surfactant or mixture of surfactants and a polyglycol, said surfactant or mixture of surfactants being selected from materials that are insoluble in the liquid hydrocarbon body, which have hydrophobic moieties at the end of hydrophilic hydrocarbon groups having greater than 8 carbon atoms and which materials are capable of forming stable foams with air and water and said polyglycol being selected from dihydroxy derivatives of linear aliphatic hydrocarbons having a molecular weight of from about 100 to about 1200, the amount of polyglycol in said composition ranging from about 5 wt. % to about 50 wt. % based on the total weight of the evaporation retarding mixture.

4,326,987

REACTION PRODUCTS OF ALKYL AND ALKENYL SUCCINIC ACIDS AND ETHER DIAMINES

Carl C. Hendricks, East Alton, Ill.; Richard L. Godar, and Kenneth R. Roux, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Feb. 25, 1980, Ser. No. 124,031
Int. Cl.[3] C23F *11/12, 11/14*
U.S. Cl. 252—392 21 Claims

1. A composition comprising the reaction product of

(1) an alkenyl or alkyl succinic acid or the anhydride thereof; and

(2) an alkyl etherdiamine.

4,326,988

CATALYST, METHOD OF PRODUCING THE CATALYST, AND POLYMERIZATION PROCESS EMPLOYING THE CATALYST

Melvin B. Welch, Bartlesville, Okla.; Richard E. Dietz, Borger, Tex., and Charles E. Capshew, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 12, 1980, Ser. No. 177,312
Int. Cl.[3] C08F *4/64, 4/68*
U.S. Cl. 252—429 B 22 Claims

1. A method of making a catalyst comprising mixing a first catalyst component solution and a second catalyst component, wherein the first catalyst component is formed by the chemical combination of:

(1) a metal halide compound selected from the group consisting of metal dihalide compounds and metal hydroxyhalide compounds and the metal of the metal halide compound is selected from the group consisting of Group IIA metals and Group IIB metals, and

(2) a transition metal compound in which the transition metals are selected from Groups IVB and VB and the transition metal is bonded to at least one radical selected from the group consisting of hydrocarbyloxides, amides, imides, and mercaptides;

wherein the second catalyst component is a precipitating agent selected from the group consisting of (a) organometallic compounds of Groups I, II, and III selected from the group consisting of lithium alkyls, Grignard Reagents, dialkyl magnesium compounds, dialkyl zinc compounds, and hydrocarbyl aluminum halides, (b) metal halides and oxyhalides of metals of Group IIIA, IVA, IVB, VA, and VB, (c) hydrogen halides, and organic acid halides selected from the group consisting of compounds having the formula

wherein R‴ is an alkyl, aryl, or cycloalkyl group or combinations thereof and X is a halide, and depositing prepolymer on said catalyst in an amount in the range of about 1 to about 50 weight percent of the prepolymerized catalyst, said prepolymer being formed by polymerizing monomers selected from the group consisting of aliphatic mono-1-olefins and conjugated dienes.

4,326,989

CATALYST OF NICKEL COMPOUND AND LIGAND IN PRESENCE OF A REDUCING METAL

Ismael Colon, Middlesex; Louis M. Maresca, Belle Mead, and George T. Kwiatkowski, Green Brook, all of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 72,310, Sep. 11, 1979, Pat. No. 4,263,466, which is a continuation-in-part of Ser. No. 955,758, Oct. 30, 1978, abandoned. This application Nov. 12, 1980, Ser. No. 206,147
Int. Cl.[3] B01J *31/02*
U.S. Cl. 252—429 R 2 Claims

1. A catalyst composition comprising an anhydrous nickel compound and at least one ligand selected from the group consisting of a triaryl phosphine having 6 to about 14 carbon atoms in each aryl moiety and an aromatic bidentate compound containing at least one ring nitrogen atom and about 5 to about 30 carbon atoms, at least one metal selected from metallic magnesium and manganese and at least one promoter selected from alkali, alkaline earth, zinc, magnesium, manganese, and aluminum halides, sulfates or phosphates, wherein the amount of ligand is about 0.1 to about 100 moles per gram atom of nickel and the amount of the metallic magnesium and manganese is at least about 1 gram atom per gram atom of nickel and the amount of promoter is at least 0.1 moles per gram atom of nickel.

4,326,990

PASSIVATING AGENT COMPOSITION AND METHOD FOR ITS PREPARATION

Harold W. Mark, and Ernest A. Zuech, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 14, 1980, Ser. No. 121,568
Int. Cl.[3] B01J *31/12*
U.S. Cl. 252—431 C 19 Claims

1. A composition comprising:

a stannous dihydrocarbylphosphorodithioate and an antimony (III) dihydrocarbylphosphorodithioate in an amount sufficient to provide the composition with a weight ratio of antimony to tin in the range of from about 5:1 to about 20:1.

4,326,991

PROCESS FOR PREPARING A CATALYST FOR HYDROTREATMENT OF HEAVY HYDROCARBON OILS

Sachio Asaoka; Yoshimi Shiroto; Munekazu Nakamura, all of Yokohama, Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Filed Oct. 15, 1979, Ser. No. 84,764
Claims priority, application Japan, Oct. 14, 1978, 53-125689; Dec. 13, 1978, 53-153200
Int. Cl.[3] B01J *21/06, 21/10, 23/22, 27/04*
U.S. Cl. 252—432 4 Claims

1. A process of preparing a catalyst for the hydrotreatment of heavy hydrocarbon oils which comprises contacting a substrate of porous clay mineral consisting essentially of magnesium silicate and having a double-chain structure, with a heavy hydrocarbon oil containing at least 200 ppm by weight of vanadium, at a temperature of 350°–450° C., under a hydrogen pressure of 30–250 atm., so as to accumulate at least about 2% by weight of vanadium on said substrate.

4,326,992

PROCESS FOR PREPARING A SUPPORTED MOLYBDENUM CARBIDE COMPOSITION

Lynn H. Slaugh, and Ronald J. Hoxmeier, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 8, 1980, Ser. No. 213,972
Int. Cl.³ B01J *23/28, 27/22*
U.S. Cl. 252—443 **4 Claims**

1. A process for preparing a supported molybdenum carbide composition which comprises impregnating a porous, inert support with a solution of molybdic acid dissolved in aqueous ammonium hydroxide, heating the impregnated support in order to dry said support and subsequently heating the impregnated support to a temperature ranging from about 650° C. to about 750° C. in a carbiding gas mixture which comprises hydrogen in a concentration ranging from about 1 to about 20 percent by volume, a carbiding component selected from the group consisting of lower alkane, lower alkene, carbon monoxide and mixtures thereof in a concentration ranging from about 0.5 to about 5 percent by volume and the balance being a noble gas.

4,326,993

NOVEL CRACKING CATALYSTS AND CATALYST SUPPORTS

Arthur W. Chester, Cherry Hill, and William A. Stover, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 17, 1979, Ser. No. 104,522
Int. Cl.³ B01J *29/28, 29/32*
U.S. Cl. 252—455 Z **12 Claims**

1. A composition, suitable for use as a catalyst or catalyst support, prepared by mixing from 1 to 99 wt. % of colloidal dispersions of alumina particles, from 1 to 99 wt. % of colloidal dispersions of silica particles, from 1 to about 75 wt. % of a suitable particulate weighting agent and from 1 to about 75 wt. % of a crystalline aluminosilicate zeolite hydrocarbon conversion component and thereafter drying the resultant composite; said alumina and silica particles each having diameters in the range of 10 to 10,000 Å and said composite having at least 40% of the pore volume in the 30 to 300 Å diameter range, between 60 and 80 Å, and at least 25% of total pore volume in excess of 30 Å between said 60 and 80 Å range.

4. A catalyst as defined in claim 1 wherein said hydrocarbon conversion component is a zeolite selected from the group consisting of ZSM-4, ZSM-5, ZSM-11, ZSM-12, ZSM-35 and ZSM-38.

9. A composition comprising a hydroconversion catalyst support or matrix prepared as described in claim 1 by mixing therewith from 20 to 90 wt. % of colloidal alumina particles and from 10 to 80 wt. % of colloidal silica particles and a hydrogenating component selected from metals of Group VIB and VIII of the Periodic Table.

4,326,994

ENHANCEMENT OF ZEOLITE CATALYTIC ACTIVITY

Werner O. Haag, Lawrenceville, N.J., and Rudolph M. Lago, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 14, 1980, Ser. No. 121,339
Int. Cl.³ B01J *29/28, 29/06*
U.S. Cl. 252—455 Z **17 Claims**

1. A method for increasing the catalytic activity of an acid zeolite having a determinable initial activity and characterized by a silica to alumina mole ratio of at least 12 and a constraint index within the approximate range of 1 to 12, comprising contacting said zeolite with water for a sufficient treating time, temperature and water partial pressure wherein said time, temperature and pressure is represented by the following relationship of treating time and water pressure at constant temperatures:

$$0.01(Pt)_T < (Pt) < 10(Pt)_T$$

where

$(Pt)_T = 2.6 \times 10^{-9} e\ 16000/T$

P = Water Partial Pressure, atmosphere

t = Treating Time, Hours

T = Temperature, °K.

4,326,995

CATALYST FOR HYDROTREATING CARBONACEOUS LIQUIDS

Lloyd Berg; Frank P. McCandless, both of Bozeman, Mont., and Ronald J. Ramer, Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 7, 1979, Ser. No. 101,361
Int. Cl.³ B01J *21/04, 23/85, 23/88*
U.S. Cl. 252—465 **2 Claims**

1. In a catalyst for the continuous-flow hydrogenation and denitrogenation of carbonaceous liquids produced in the solvent refining of coal containing combined sulfur of 0.2–0.8% and combined nitrogen of 0.5–1.5% by weight within carbonaceous compounds, said catalyst having a base comprising a major proportion of alumina with deposited oxides of catalytic metals, the improved combination comprising a base material that includes a surface area of about 250 m^2/g, a pore volume of about 0.7 ml/g and an average pore diameter of 120–130 Angstroms and said deposited oxides of catalytic metal include in percent total weight 10–11% WO_3, 2–3% NiO, 6–7% CoO and 12–13% MoO_3.

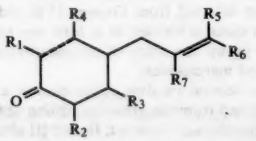
4,326,996

FRAGRANCE COMPOSITION COMPRISING SUBSTITUTED CYCLOHEXANE DERIVATIVES

Brian J. Willis, Bergenfield, N.J., and Robert G. Eilerman, Merrick, N.Y., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

Filed Jan. 30, 1980, Ser. No. 116,839
Int. Cl.³ A61K *7/46*
U.S. Cl. 252—522 R **5 Claims**

1. A perfume composition which comprises one or more of the substituted cyclic ketones having the structure:



wherein the dotted line may be a carbon-carbon double bond or a carbon-carbon single bond; and wherein each of R_1, R_2, R_3, R_4, R_5, R_6 and R_7 may be hydrogen or lower alkyl in an amount effective to impart fragrance thereto in combination with conventional perfume ingredients.

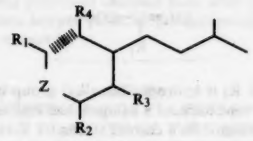
4,326,997

FRAGRANCE COMPOSITIONS OF ALICYCLIC KETONE AND ALCOHOL DERIVATIVES

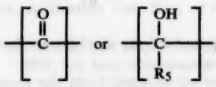
Brian J. Willis, Bergenfield, N.J.; Robert G. Eilerman, Merrick, N.Y., and John M. Yurecko, Jr., Bayonne, N.J., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

Filed Oct. 8, 1980, Ser. No. 194,967
Int. Cl.³ A61K *7/46*
U.S. Cl. 252—522 R **14 Claims**

1. A fragrance composition which comprises at least one compound having the structure:



wherein the dashed line represents either a carbon-carbon double bond or a carbon-carbon single bond; wherein Z is either



and wherein each of R_1, R_2, R_3, R_4 and R_5 is hydrogen or C_1 to C_4 alkyl, in an amount effective to impart fragrance thereto and conventional fragrance ingredients.

4,326,998

METHYL SUBSTITUTED NORBORNANE CARBOXALDEHYDES PERFUME COMPOSITIONS

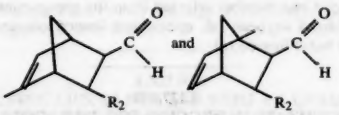
Philip T. Klemarczyk, Old Bridge; James M. Sanders, Eatontown; Manfred H. Vock, Locust; Joaquin F. Vinals, Rumson; Frederick L. Schmitt, Holmdel, and Edward J. Granda, Englishtown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 152,187, May 22, 1980, Pat. No. 4,284,824. This application Mar. 25, 1981, Ser. No. 247,323

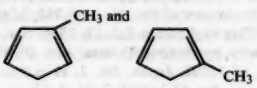
Int. Cl.³ A61K *7/46*

U.S. Cl. 252—522 R **2 Claims**

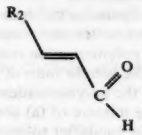
1. A process for augmenting or enhancing the aroma of a perfume or cologne composition comprising the step of adding to a perfume or cologne base an aroma augmenting or enhancing quantity of a product containing a mixture of methyl substituted norbornane carboxyaldehydes having the structures:



wherein R_2 is methyl produced according to the process which consists of the step of admixing a mixture of methyl cyclopentadienes having the structures:



with an alpha, beta unsaturated aldehyde defined according to the structure:



wherein R_2 is methyl in the presence of a catalyst having the structure:

$$R_m'AlX_n$$

wherein R′ is C_1–C_3 alkyl and X is chloro or bromo with m+n=3 and m being 1 or 2 and n being 1 or 2; the reaction taking place at a temperature of between 0° C. and 50° C.; the reaction taking place in the presence of an inert solvent and in the presence of triethanolamine.

4,326,999

LUBRICANT AND RELEASE AGENT FOR MOLDED RUBBER ARTICLES

Hans-Ferdi Fink, Essen, and Rolf Freiberger, Schermbeck-Damm, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Sep. 25, 1979, Ser. No. 78,767

Claims priority, application United Kingdom, Oct. 16, 1978, 40688/78

Int. Cl.³ L08L *91/00;* **G08L** *83/04*

U.S. Cl. 524—261 **8 Claims**

1. A composition for use as a lubricant and release agent in the manufacture of molded long rubber hoses consisting essentially of a mixture of a hardenable, modified silicone resin prepared by the condensation reaction of alkyl or aryl substituted polysiloxane having SiO-alkyl groups thereon with hydroxyl containing polyester, and an oil, the oil having the property of not dissolving or swelling rubber, the weight ratio of resin to oil being from 5:1 to 1:20.

4,327,000

STABILIZER MIXTURES FOR STABILIZING CHLORINATED THERMOPLASTICS

Horst Müller, Fürth, and Hermann O. Wirth, Bensheim, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 24, 1980, Ser. No. 133,160

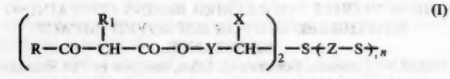
Claims priority, application Switzerland, Apr. 5, 1979, 3188/79

Int. Cl.³ C08K *5/36*

U.S. Cl. 524—285 **10 Claims**

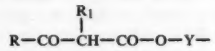
1. A stabilizer mixture consisting of

(a) a thioether of the formula I



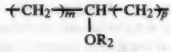
(I)

wherein n is 0 or 1, R as recurrent symbol is the same or different on each recurrence and is C_1–C_{18}alkyl, C_5–C_8 cycloalkyl, C_6–C_{10} aryl which is unsubstituted or substituted by C_1–C_4alkyl, R_1 as recurrent symbol is the same or different on each recurrence and is hydrogen or C_1–C_4alkyl, X as recurrent symbol is the same or different on each recurrence and is hydrogen or a group of the formula II



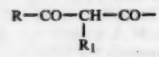
(II)

Y as recurring symbol is the same or different on each recurrence and is C_1–C_6alkylene or a group of the formula III



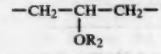
(III)

wherein the $-CH_2)_m$ group is bonded to the oxygen atom and R_2 is hydrogen or a group of the formula IV



(IV)

m is an integer from 1 to 4 and p is an integer from 0 to 3, and Z is C_1–C_6alkylene or a group of the formula V



(V)

wherein R_2 is as previously defined, and

(b) a stabilizer containing a metal selected from the group consisting of zinc, calcium, cadmium, barium, magnesium, tin and antimony, or also zinc in combination with at least one of the above metals.

4,327,001

LOW SMOKE POLYOLEFIN JACKET COMPOSITION FOR ELECTRICAL WIRE

Archie West, Greenville, and Dhirajlal B. Radadia, Lincoln, both of R.I., assignors to Gulf & Western Manufacturing Company

Filed Jul. 1, 1980, Ser. No. 165,145
Int. Cl.³ C08L *91/00*
U.S. Cl. 524—322 **8 Claims**

1. A cross-linked polyolefin jacketing composition for use on wire and cable having superior resistance to the propagation of flame, a low smoke emission level and low emission of toxic byproducts when subjected to heat or flame, as well as low moisture absorption characteristics and high resistance to weathering, oils and chemicals, which consists essentially of a polyethylene-vinyl acetate copolymer, magnesium silicate, and alumina hydrate in major proportions, and, in minor proportions, carbon black, polymerized 1,2-dihydro 2,2,4 trimethyl quinoline, stearic acid, vinyl-tris (β-methoxethoxy)silane, triallyl cyanurate, and di-cumyl peroxide in anhydrous aluminum silicate.

4,327,002

HIGH NITRILE COPOLYMER RESINS CONTAINING EPOXIDIZED OIL FOR IMPROVED IMPACT RESISTANCE

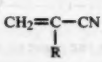
Daniel W. Feldman, Beachwood, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 26, 1979, Ser. No. 106,972
Int. Cl.³ C08L *9/04, 9/08, 91/00*
U.S. Cl. 524—114 **6 Claims**

1. The composition which comprises an intimate mixture of 100 parts by weight of

(I) a polymer prepared by the polymerization in an aqueous medium of 100 parts by weight of

(A) from 60 to 90% by weight of at least one nitrile having the structure

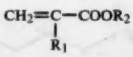


wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and

(B) from 10 to 40% by weight based on the combined weight of (A) plus (B) of at least one member selected from the group consisting of

(1) styrene,

(2) an ester having the structure



wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms,

(3) an alpha-olefin having the structure

wherein R′ and R″ are alkyl groups having from 1 to 7 carbon atoms,

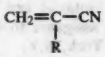
(4) a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers,

(5) vinyl acetate, and

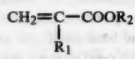
(6) indene,

in the presence of from 1 to 40 parts by weight of

(C) a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and from 0 to 50% by weight of at least one comonomer selected from the group consisting of styrene, a nitrile monomer having the structure



wherein R has the foregoing designation, and an ester having the structure



wherein R_1 and R_2 have the foregoing designations, and from about 0.1 to 20 parts by weight of

(II) at least one member selected from the group consisting of epoxidized soybean oil, epoxidized linseed oil, and epoxidized butyl linseed oil.

4,327,003

POLYMERIZATION PROCESS FOR THE PRODUCTION OF PVC LATEX AND PASTE RESIN

Paul L. C. Hao; W. W. Hsu; W. S. Lin; S. N. Tong; H. K. Hung, and M. C. Chang, all of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Continuation of Ser. No. 856,602, Dec. 1, 1977, abandoned, Continuation-in-part of Ser. No. 689,743, May 25, 1976, abandoned. This application Jul. 11, 1980, Ser. No. 168,765
Claims priority, application Taiwan, Aug. 30, 1975, 64-11795; Sep. 13, 1975, 64-11902; Japan, Jul. 2, 1976, 51/77932
Int. Cl.³ C08F *2/24, 2/32*
U.S. Cl. 523—336 **8 Claims**

1. An emulsion polymerization process for preparing a polyvinyl chloride latex having a particle size predominantly of 0.8 to 2 microns which comprises:

(a) forming in a polymerization zone a mixture of a vinyl chloride monomer, water, and a water-soluble initiator so as to initiate the polymerization reaction as a water-in-oil reaction phase; the weight ratio of monomer to water at the beginning of the polymerization being greater than 3,

(b) feeding into the mixture of (a) above over an extended period an aqueous emulsifier solution so that as the emulsion polymerization reaction proceeds the water-in-oil

initial reaction phase changes to an oil-in-water reaction phase, and

(c) collecting polyvinyl chloride latex after polymerization is complete having particles predominantly 0.8 to 2 microns in diameter.

4,327,004

AQUEOUS DISPERSIONS OF PLASTICS IN WHICH THE AVERAGE DIAMETER OF THE DISPERSION PARTICLES IS IN THE RANGE FROM ABOUT 50 TO 500 NM, AND A PROCESS FOR THEIR PREPARATION

Adolf Schmidt, Cologne, and August Böckmann, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 30, 1980, Ser. No. 173,568

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012821

The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.

Int. Cl.³ C08L *27/06*

U.S. Cl. 524—745 **14 Claims**

1. In a process for the preparation of an aqueous dispersion of a synthetic polymer by polymerization of a monomer or mixture of monomers thereof in an aqueous medium in the presence of an initiator and an emulsifier, the improvement wherein said emulsifier comprises an alkali metal salt of a polysulfonic acid of an alkane of 8 to 22 carbon atoms.

4,327,005

PROCESS FOR THE PREPARATION OF STABILIZED POLYMER DISPERSIONS IN POLYOL AT LOW TEMPERATURE

Gerhard G. Ramlow, Grosse Ile; Duane A. Heyman, Monroe, and Richard A. Moore, Trenton, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Aug. 18, 1980, Ser. No. 179,137

Int. Cl.³ C08K *5/06, 2/14, 5/15;* C08G *65/00*

U.S. Cl. 524—377 **11 Claims**

1. In a process for the preparation of a graft copolymer dispersion in a polyol prepared by the in situ polymerization, in the presence of a free-radical initiator, of an ethylenically unsaturated monomer or mixture of monomers in a polyol, the improvement comprises conducting said polymerization in the presence of an effective amount of a preformed polymeric stabilizer wherein said stabilizer consists of an alkylene oxide adduct of a copolymer of styreneallyl alcohol having an equivalent weight of 220 to 8000.

4,327,006

WRITING LIQUID FOR USE WITH AN OPAQUE RECORDING MATERIAL FOR FORMING TRANSPARENCIES FOR OVERHEAD PROJECTION AND THE LIKE

Claude Ceintrey, Paris, France, assignor to La Cellophane, Paris, France

Division of Ser. No. 912,546, Jun. 5, 1978, Pat. No. 4,252,601. This application Sep. 2, 1980, Ser. No. 183,376

Claims priority, application France, Mar. 1, 1978, 78 05816

Int. Cl.³ B44C *1/22;* C08K *5/01;* C09D *11/16;* C08K *5/02*

U.S. Cl. 524—315 **8 Claims**

1. A writing liquid for transparentizing an opaque layer of an organic styrene resin pigment uniformly distributed as fine particles in a film forming binder carried on a transparent or opaque support, said writing liquid consisting essentially of a mixture of a solvent for the styrene resin pigment and one or more chlorofluoroalkanes having a boiling point of more than 0° C. at atmospheric pressure and represented by the formula:

$$(CFxClyHz)—(CFx'Cly'Hz')_n—(CFx''Cly''Hz'')_m$$

wherein

n=0 or 1

x, x', x''=0, 1, 2 or 3

y, y', y''=0, 1, 2 or 3

z, z', z''=0, 1 or 2

when n=0 then m=0 and x+y+z=4

when n=1 then m=0 or 1

when n=1 then m=0

then x+y+z=x'+y'+z'=3 and when n=1 and m=1

then x+y+z=x''+y''+z''=3 and x'+y'+z'=2

at a weight ratio of solvent to chlorofluoroalkane of from 10:90 to 80:20 with the proviso that in the case of gaseous chlorofluoroalkanes the amount of the gaseous chlorofluoroalkane is limited by its solubility at room temperature in said solvent or in a liquid chlorofluoroalkane when a mixture of a gaseous chlorofluoroalkane and a liquid chlorofluoroalkane is used.

4,327,007

POLYETHYLENE TEREPHTHALATE COMPOSITION CONTAINING ALIPHATIC PLASTICIZER AND NUCLEATING AGENT

Nicholas Vanderkooi, Jr., Pompton Plains, and Harold W. Tuller, Long Valley, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 22, 1980, Ser. No. 219,088

Int. Cl.³ C08K *5/11;* C08L *67/00*

U.S. Cl. 524—315 **24 Claims**

1. A composition comprising:

polyethylene terephthalate;

up to about 15 percent based on the weight of the polyethylene terephthalate of a plasticizer which comprises an ester of an aliphatic carboxylic acid having from 2 to 8 carbon atoms and at least 1 carboxyl group, and an alcohol having from 1 to 10 carbon atoms and 1 hydroxyl group; and

up to about 10 percent, based on the weight of the polyethylene terephthalate, of a nucleating agent which comprises the sodium salt of a hydrocarbon acid having from 9 to about 25 carbon atoms, and at least 1 carboxyl group.

4,327,008

URETHANE RHEOLOGY MODIFIERS AND COATING COMPOSITIONS CONTAINING SAME

Karl F. Schimmel, Verona; Jerome A. Seiner, Pittsburgh; Roger M. Christenson, and Rostyslaw Dowbenko, both of Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 29, 1980, Ser. No. 221,146

Int. Cl.³ C08G *18/12, 18/48*

U.S. Cl. 524—104 **44 Claims**

1. A urethane rheology modifier characterized in having a branched structure and terminal hydrophobic groups, derived from the reaction of:

(a) for each 8 moles of a polyalkylene oxide having a molecular weight of from about 2,000 to about 20,000;

(b) from about 0.1 moles to about 3 moles of a polyfunctional material, said material being a compound having at least 3 active hydrogens capable of reacting with isocyanate or a polyisocyanate having at least 3 isocyanate groups;

(c) from about 7 moles to about 30 moles of a diisocyanate;

(d) from about 3 moles to about 14 moles water; and

(e) sufficient monofunctional active hydrogen-containing compound or monoisocyanate to end-cap substantially all free isocyanate or hydroxy groups.

32. A coating composition consisting essentially of a film-forming polymeric resin and about 0.1% to about 10%, based on the film-forming polymeric resin solids, of a rheology modifier, said modifier characterized in having a branched structure, terminal hydrophobic groups and derived from the reaction of:

(a) for each 8 moles of a polyalkylene oxide having a molecular weight of from 2,000 to about 20,000;

(b) from about 0.1 moles to about 3 moles of a polyfunctional material, said material being a compound having at least 3 active hydrogens capable of reacting with isocyanates or is a polyisocyanate having at least 3 isocyanate groups;

(c) from about 7 moles to about 30 moles of a diisocyanate;
(d) from about 3 moles to about 14 moles water; and
(e) sufficient monofunctional active hydrogen-containing compound or monoisocyanate to end-cap substantially all free isocyanate or hydrogen groups.

4,327,009

ANTI-BLOCK ADDITIVES FOR OLEFIN POLYMERS

James A. Allen; George W. Knight, both of Lake Jackson, and Morris S. Edmondson, Alvin, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 29, 1980, Ser. No. 191,594
Int. Cl.³ C08K *5/06*
U.S. Cl. 524—114 **10 Claims**

1. A process for reducing block, but retaining high cling, of extrusion-cast films of linear, low density, ethylene copolymers which inherently exhibit high block and high cling, said process comprising

incorporating into the said copolymer, prior to extrusion-casting into films, an effective amount in the range of about 0.04 to about 4 weight percent of at least one block-reducing agent comprising a liquid organic having a molecular weight in the range of about 300 to about 5000, a Saybolt viscosity of at least 100 centistokes at 25° C., a boiling point above 285° C., and

extrusion-casting the mixture into a thin film.

4,327,010

SOLUTION OF FLUORINATED POLYMER HAVING CARBOXYLIC ACID SALT GROUPS

Manabu Suhara, and Kiyotaka Arai, both of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 6,876, Jan. 25, 1979, Pat. No. 4,259,226. This application Dec. 10, 1979, Ser. No. 101,685
The portion of the term of this patent subsequent to Mar. 31, 1998, has been disclaimed.
Int. Cl.³ C08K *5/05*; C08L *27/14*
U.S. Cl. 524—388 **8 Claims**

1. A solution of a fluorinated polymer which is selected from the group consisting of a homopolymer of a fluorinated vinyl monomer having a carboxylic acid group or a functional group convertible into a carboxylic acid group, and a copolymer of said fluorinated vinyl monomer with a fluorinated olefin, wherein said flourinated polymer has less than 900 of an equivalent of carboxylic acid groups having the formula:

—COOM

wherein M represents an alkaline metal atom or a metal atom in group IIa or IIb of the Periodic Table or an ammonium group or an amine group, in a highly polar organic solvent having a hydroxyl group.

4,327,011

PRINTING INK AND VEHICLE THEREFOR

Robert H. Ripley, Grand Rapids; Robert W. Karsten, Zeeland, both of Mich.; Eugene M. Brandon, Marlton, N.J., and James W. Lockerby, Downers Grove, Ill., assignors to Century Inks Corporation, Park Ridge, Ill.

Continuation-in-part of Ser. No. 96,193, Nov. 20, 1979, abandoned. This application Jan. 19, 1981, Ser. No. 226,392
Int. Cl.³ C08K *5/01*
U.S. Cl. 524—474 **14 Claims**

1. A printing ink vehicle comprising 50–70% by weight polymer solids in 30 to 50% of an essentially aliphatic hydrocarbon solvent boiling between 390°–595° F., such solids being prepared from monomers polymerized to a resin having a molecular weight in the range of 4,000 to 50,000, such monomers comprising:

30–63% styrene, and 37 to 70% of acrylates and methacrylates of which at least 25% are monomers having at least C_6 alkyl chain length.

4,327,012

POLYMER BLENDS WITH IMPROVED HYDROLYTIC STABILITY

Gideon Salee, Williamsville, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 193,052, Oct. 2, 1980, abandoned, which is a continuation of Ser. No. 90,179, Nov. 1, 1979, abandoned. This application Mar. 20, 1981, Ser. No. 245,789
Int. Cl.³ C08L *67/02*
U.S. Cl. 523—203 **26 Claims**

1. A thermoplastic polymeric composition comprising, in admixture, (a) a linear aromatic polyester of monomer components consisting essentially of a bisphenol and a dicarboxylic acid, and (b) a SAN polymer.

16. The composition of claim 1 which also includes a filler material.

4,327,013

POLY(ACRYLATE) CONTAINING COMPOSITIONS AND PROCESS FOR PRODUCING MOLDED ARTICLES

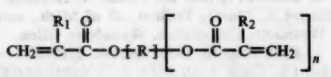
Edward N. Peters, Piscataway, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 35,012, May 1, 1979, abandoned. This application Mar. 27, 1980, Ser. No. 129,883
Int. Cl.³ C08K *7/14*
U.S. Cl. 524—538 **13 Claims**

1. A molding composition for producing fiber reinforced molded articles comprising:

(A) a curable resin portion containing:

(i) from 5 to about 60 weight percent of a poly(acrylate) characterized by the following empirical formula:



wherein R is the hydroxyl-free residue of an organic polyhydric alcohol which contained hydroxyl groups bonded to different carbon atoms, R_1 and R_1 are independently hydrogen or methyl, and n is 1 to 3, (ii) from about 5 to about 60 weight percent of a monoethylenically unsaturated monomer which is soluble in and copolymerizable with (i), wherein (i) plus (ii) have a viscosity of from about 1 to about 50 centipoise, (iii) from about 0.2 to about 3 weight percent of an elevated temperature free-radical curing catalyst capable of effecting the coreaction of (i) and (ii), and

(B) one or more reinforcing fibers with a melting point or a glass transition temperature above about 130° C., wherein said fibers are present in amounts of from about 15 to about 80 weight percent; said weight percents in (A) and (B) being based on the total weight of the composition.

4,327,014

RESIN-FORMING MATERIAL, IMPLANT MATERIAL AND COMPOSITIONS FOR RESTORATIVE MATERIAL SUITABLE FOR MEDICAL OR DENTAL USE

Haruyuki Kawahara, Moriguchi; Teruo Makita, Kobe; Shozo Kudo, Minoo, and Takashi Funakoshi, Osaka, all of Japan, assignors to Kanebo Ltd., Tokyo, Japan

Filed Apr. 9, 1980, Ser. No. 138,814
Claims priority, application Japan, Apr. 11, 1979, 54-44752; Apr. 11, 1979, 54-44753
Int. Cl.³ C08K *3/28*
U.S. Cl. 523—116 **7 Claims**

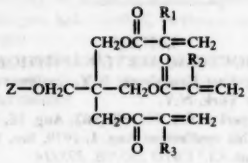
1. A composition of matter, especially useful as a dental filling material, comprising

(A) from about 50 to about 95% by weight of finely divided, inorganic filler material and which is safe and effective for use in a dental filling in the human body, wherein at least

50% by weight of said filler material is at least one nitride substance having a Moh's hardness of at least 7 and is selected from the group consisting of vanadium nitride, boron nitride, aluminum nitride, silicon nitride, titanium nitride and zirconium nitride, and the balance of said filler material is one or more inorganic dental filler substances which are different from said nitride substance, have a Moh's hardness of at least 5 and are useful as a filler for dental filling materials, and

(B) from about 50 to about 5% by weight of polymerizable monomer component capable of polymerizing to form a binder resin, wherein said monomer component consists essentially of

(1) from 60 to 100% by weight of at least one, first polymerizable monomer having the formula (I)



(I)

wherein Z is hydrogen or

and R_1, R_2, R_3 and R_4, which are the same or different, each is selected from the group consisting of hydrogen, methyl, ethyl or propyl, and

(2) up to 40% by weight of at least one, second polymerizable monomer which is different from said first polymerizable monomer and is suitable for use as a resin-forming monomer for dental filling materials.

4,327,015
FLAME RESISTANT, TRANSPARENT POLYCARBONATES COMPRISING BISULFITE ADDUCTS

Frank Druschke, Stuttgart; Dieter Margotte, Krefeld; Wolfgang Cohnen, Leverkusen, and Karsten Idel, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 11, 1981, Ser. No. 262,109

Claims priority, application Fed. Rep. of Germany, May 22, 1980, 3019527

Int. Cl.³ C08K *5/41, 5/42*

U.S. Cl. 524—162 **5 Claims**

1. Polycarbonates based on diphenols, characterized in that they comprise from 0.001 to 0.4% by weight, relative to the weight of polycarbonate, of an additive selected from the group consisting of aldehyde-bisulphite adducts and ketone-bisulphite adducts.

4,327,016
ORGANOTIN COMPOUNDS, AND THEIR USE

Wolfgang Wehner, Zwingenberg; Horst Müller, Fürth, and Hans-Günter Köstler, Heppenheim, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

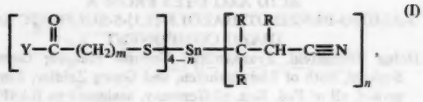
Filed May 1, 1980, Ser. No. 145,417

Claims priority, application Switzerland, May 7, 1979, 4255/79

Int. Cl.³ C07F *7/22*; C08K *5/58*

U.S. Cl. 524—180 **10 Claims**

1. A compound of the formula I



(I)

wherein each R independently is hydrogen or C_1–C_4 alkyl, Y is the —OR′ or —S—R″ group, in which R′ is C_{12}–C_{16} alkyl and R″ is C_8–C_{20} alkyl, C_2–C_{20} alkenyl, C_6–C_{20} aryl or C_7–C_{20} aralkyl, m is an integer from 1 to 6, and n is 1 or 2.

10. A method for stabilizing halogen-containing thermoplastic polymers against the degradative effects of heat and light which comprises incorporating into said thermoplastic an effective stabilizing amount of a compound according to claim 1.

4,327,017
AGENT OF CHROMA AND BRIGHTNESS FOR PIGMENTS

Seigo Iwamoto, Tokyo, and Eiichi Saito, Hachioji, both of Japan, assignors to Nihonshikizai Kogyo Co., Ltd. and Takeda Chemical Industries, Ltd., both of Osaka, Japan, part interest to each

Filed Mar. 6, 1980, Ser. No. 127,981

Claims priority, application Japan, Mar. 8, 1979, 54-27481; Nov. 8, 1979, PCT/JP79/00288

Int. Cl.³ C09C *3/10*; C09F *1/04*

U.S. Cl. 260—105 **4 Claims**

1. An agent for improving the chroma and brightness of pigments, which consists of the product of reaction of a basic polyaluminum or aluminum salt with a resin acid or its salt, said resin acid being derived from a rosin or a modified rosin.

4,327,018
AZO DYES AND THE PRODUCTION AND USE THEREOF

Hans W. Liechti, Oberwil; Kurt Burdeska, Basel, and Jürgen Markert, Ettingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

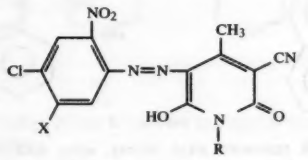
Continuation of Ser. No. 855,100, Nov. 25, 1977, abandoned. This application Sep. 17, 1979, Ser. No. 75,861

Claims priority, application Luxembourg, Dec. 1, 1976, 76304

Int. Cl.³ C09B *29/36*

U.S. Cl. 260—156 **3 Claims**

1. An azo dye of the formula



wherein

R is alkyl of 1 to 4 carbon atoms; and

X is chloro or phenoxy.

4,327,019
ACID AZO DYES FROM A 3-AMINO-BENZISOTHIAZOLE-[2,1]-5-SULFONIC ACID DIAZO COMPONENT

Heinz Ellingsfeld, Frankenthal; Guenter Hansen; Guenther Seybold, both of Ludwigshafen, and Georg Zeidler, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

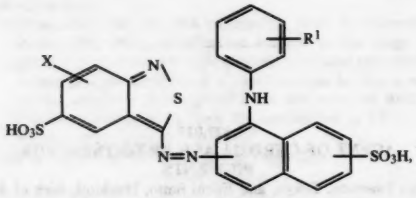
Continuation of Ser. No. 757,431, Jan. 6, 1977, abandoned. This application Dec. 28, 1978, Ser. No. 973,800

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1976, 2601603

Int. Cl.³ C07C *107/04;* C09B *29/039, 29/095*

U.S. Cl. 260—158 7 Claims

1. An acid dye which in the form of the free acid has the formula



wherein:

X is hydrogen, chloro, bromo, nitro, C_1- to C_4-alkyl, methoxy, ethoxy or NHCO-(C_1 to C_4-alkyl)

R^1 is hydrogen, chloro, methyl, methoxy or ethoxy.

4,327,020
BIS-AZO COMPOUNDS

Masaomi Sasaki, Shizuoka; Masafumi Ohta, and Kyoji Tsutsui, both of Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

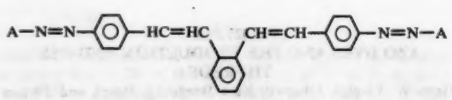
Filed Jun. 11, 1980, Ser. No. 158,455

Claims priority, application Japan, Jun. 20, 1979, 54-76714

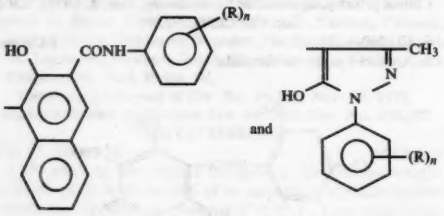
Int. Cl.³ C07C *107/04, 107/08;* C09B *35/03, 35/033*

U.S. Cl. 260—160 14 Claims

1. A Bis-azo compound of the formula



in which A represents identical substituents selected from the group consisting of



wherein R represents alkyl, alkoxy, nitro, dialkylamino or halogen, and n represents an integer 0, 1, 2 or 3 and when n is 2 or 3, R represents identical or different substituents selected from the group consisting of alkyl, alkoxy, nitro, dialkylamino and halogen.

4,327,021
PVC PLASTICIZED WITH DICYCLOHEXYLBIPHENYL AND PRIMARY PLASTICIZER

Brian C. Davis, Wilmington, Del., and Robert P. Bryer, Kennett Square, Pa., assignors to Suntech, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 74,024, Sep. 10, 1979, abandoned, which is a continuation-in-part of Ser. No. 821,012, Aug. 1, 1977, Pat. No. 4,167,504. This application Nov. 24, 1980, Ser. No. 209,446

Int. Cl.³ C08K *5/12;* C08L *27/06*

U.S. Cl. 524—297 3 Claims

1. In the process of plasticizing a polyvinychloride resin with a primary and secondary plasticizer, the improvement of using dicyclohexylbiphenyl as the secondary plasticizer in an amount sufficient to replace from about 10% to about 40% of said primary plasticizer.

4,327,022
HETEROCYCLIC ALKYL NAPHTHOLS

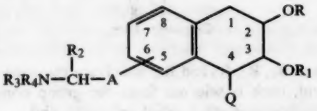
Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 388,962, Aug. 16, 1973, Pat. No. 4,169,108. This application Aug. 1, 1979, Ser. No. 63,343

Int. Cl.³ C07D *295/08, 295/14*

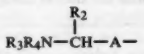
U.S. Cl. 260—239 B 16 Claims

1. A compound having the formula



wherein

the side chain represented by



occupies either position 5 or position 6 of the naphthalene nucleus;

R and R_1 are independently hydrogen, lower-alkanoyl, benzoyl or benzoyl substituted by from 1 to 2 lower-alkyl groups;

Q is hydrogen or methyl;

A is a direct linkage or CR_5R_6 where R_5 and R_6 are independently hydrogen or methyl;

R_2 is hydrogen or methyl, provided that when A is a direct linkage, or when R_5 and/or R_6 are methyl, then R_2 is hydrogen;

NR_3R_4 is pyrrolidino, piperidino, hexamethyleneimino, morpholino or any of these having from one to two lower-alkyl substituents;

or an acid-addition salt thereof.

4,327,023
INTERMEDIATES FOR PREPARING 7,8-AMINO, HYDROXY-1-PHENYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINES

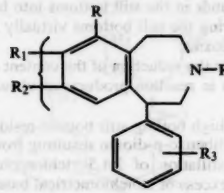
Kenneth G. Holden, Haddonfield; Carl Kaiser, Haddon Heights, both of N.J., and Joseph Weinstock, Phoenixville, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 117,181, Jan. 31, 1980. Pat. No. 4,284,556. This application Aug. 7, 1980, Ser. No. 176,178

Int. Cl.³ C07D *223/16*

U.S. Cl. 260—239 BB 4 Claims

1. A compound of the formula:



in which:

R is hydrogen, halo or lower alkyl of 1–3 carbons;

R_1 is amino, acetamido, nitro or methylsulfonamidoyl;

R_2 is benzyloxy, or when R_1 is nitro, hydroxy;

R_3 is hydrogen, halo, methyl, methoxy, methylthio or hydroxy, and

R_4 is benzyl, methyl, allyl and, when R_1 is nitro, hydrogen; together with the pharmaceutically acceptable acid addition salts thereof.

4,327,024

IMINOISOINDOLINONE PIGMENTS, PROCESS FOR THEIR PRODUCTION AND USE THEREOF

Ernst Model, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

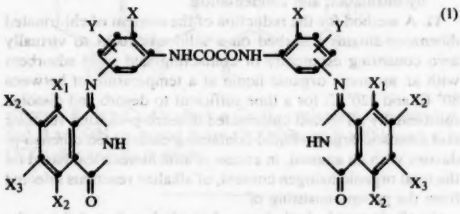
Filed Nov. 10, 1980, Ser. No. 205,806

Claims priority, application Switzerland, Nov. 20, 1979, 10343/79

Int. Cl.³ C07D *209/50*; C08K *5/00*

U.S. Cl. 260—325 PH **4 Claims**

1. An iminoisoindolinone pigment of the formula



(1)

wherein X and Y are hydrogen, halogen, alkyl or alkoxy, each of 1 to 4 carbon atoms, X_2 is chlorine or bromine, and X_1 and X_3 are chlorine, bromine, alkoxy of 1 to 4 carbon atoms, or aryloxy.

4,327,025

PREPARATION OF STYRYL-CYCLOPROPANE-CARBOXYLIC ACID ESTERS AND INTERMEDIATE THEREFOR

Manfred Jautelat, Burscheid; Dieter Arlt, Cologne; Reinhard Lantzsch, Leverkusen; Rainer Fuchs, Wuppertal; Hans-Jochem Riebel, Wuppertal; Rolf Schröder, Wuppertal, and Horst Harnisch, Much, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

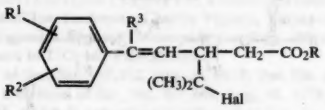
Filed Apr. 7, 1980, Ser. No. 137,685

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1979, 2916321

Int. Cl.³ C07D *325/00, 317/44*; C07C *121/60, 69/76*

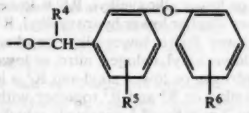
U.S. Cl. 260—338 **1 Claim**

1. A compound of the formula



in which

R is C_{1-4}-alkyl or,



R^4 is hydrogen, cyano or ethynyl,

R^5 and R^6 is hydrogen or fluorine,

R^1 is alkoxy or alkylthio, either of which may be optionally substituted by halogen,

R^2 is hydrogen or alkoxy, or

R^1 and R^2 together are optionally halogen-substituted alkylenedioxy,

R^3 is hydrogen or chlorine, and

Hal is chlorine or bromine.

4,327,026

BENZODIAZEPINE DERIVATIVES

Quirico Branca, Basel; Albert E. Fischli, and Andre' Szente, both of Riehen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

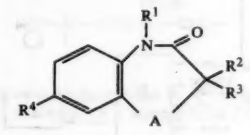
Filed Jul. 16, 1981, Ser. No. 283,711

Claims priority, application Switzerland, Jul. 31, 1980, 5841/80

Int. Cl.³ C07D *243/24*

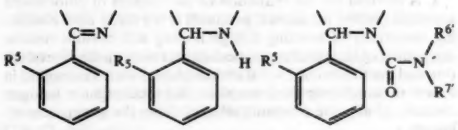
U.S. Cl. 260—239.3 D **12 Claims**

1. A compound of the formula



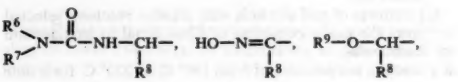
I

wherein A is the group



(a), (b) or (c),

R_1 is lower Alkyl, R^2 and R^3 each are hydrogen or lower alkyl, R^4 is the group



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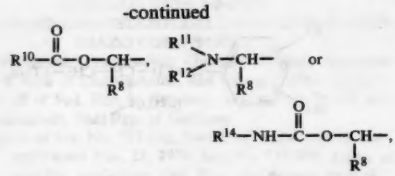


R^5 is hydrogen or halogen, R^8 is hydrogen or lower alkyl, R^9 is lower alkyl or lower alkoxyalkyl, R^{10} is lower alkyl, R^{11} is hydrogen, lower alkyl or lower hydroxyalkyl, R^{12} is hydrogen or lower alkyl and R^{14} is lower alkyl or phenyl optionally substituted by lower alkyl, halogen, nitro, or lower alkoxy, and either R^6 is hydrogen or lower alkyl and R^7 is lower alkyl or lower hydroxyalkyl or R^6 and R^7 together with the nitrogen atom are a 3- to 7-membered heterocycle which, when it is at least 5-membered, can contain as a ring member an oxygen or sulfur atom or a group of the formula $>N-R^{13}$, in which R^{13} is hydrogen or lower alkyl, and either $R^{6'}$ is hydrogen or lower alkyl and $R^{7'}$ is lower alkyl or $R^{6'}$ and $R^{7'}$ together with the nitrogen atom are a 3- to 7-membered heterocycle which, when it is at least 5-membered, can contain as a ring member an oxygen or sulfur atom or a group of the formula $>N-R^{-'}$, in which $R^{13'}$ is lower alkyl, with the proviso that R^4 is the group $R^{6'}R^{7'}N$-CO-NH-CH(R^8)-when A is the group (c),
and pharmaceutically acceptable acid addition salts thereof.

4,327,027

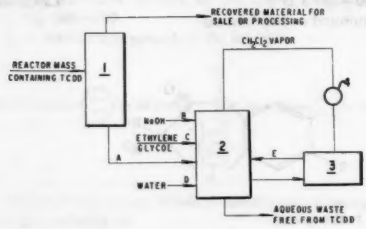
CHEMICAL DETOXIFICATION OF TOXIC CHLORINATED AROMATIC COMPOUNDS

Kenneth J. Howard, North Little Rock, and Albert E. Sidwell, Jacksonville, both of Ark., assignors to Vertac Chemical Corporation, Memphis, Tenn.

Continuation-in-part of Ser. No. 48,817, Jun. 15, 1979, abandoned. This application Feb. 7, 1980, Ser. No. 119,481

Int. Cl.³ C07D *317/44*; C07C *37/68*

U.S. Cl. 260—340.3 **14 Claims**



1. A method for the reduction of the content of chlorinated aromatic dioxins in reaction products to virtually zero consisting essentially of reacting a high boiling still bottom residue containing chlorinated aromatic dioxins resulting from production and distillation of 2,4,5-trichlorophenol with an amount, in excess of stoichiometrical based on the total organic halogen content, of alkaline reactants selected from the group consisting of:

(1) alkali metal alcoholates of alcohols selected from the group consisting of alkanols having from 1 to 5 carbon atoms, polyalkoxyalkane glycols having from 4 to 20 carbon atoms, alkanepolyols having from 2 to 5 carbon atoms and 2 to 3 hydroxyls, and monoalkyl ethers of said alkanepolyols with alkanols having from 1 to 4 carbon atoms and

(2) mixtures of said alcohols with alkaline reactants selected from the group consisting of alkali metal hydroxides and carbonates,

at a reaction temperature of from 140° C. to 220° C. for a time sufficient to convert the organic chlorine of the halogenated aromatic compounds in the still bottoms into inorganic chloride, and recovering the still bottoms virtually free of chlorinated aromatic dioxins.

9. A method for the reduction of the content of chlorinated dibenzo-p-dioxins in reaction products to virtually zero consisting of

(1) reacting a high boiling still bottom residue containing chlorinated dibenzo-p-dioxin resulting from the production and distillation of 2,4,5-trichlorophenol with an amount, in excess of stoichiometrical based on the total organic halogen content, of alkaline reactants selected from the group consisting of:

(a) alkali metal alcoholates of alcohols selected from the group consisting of alkanols having from 1 to 5 carbon atoms, polyalkoxyalkane glycols having from 4 to 20 carbon atoms, alkanepolyols having from 2 to 5 carbon atoms and 2 to 3 hydroxyls, and monoalkyl ethers of said alkanepolyols with alkanols having from 1 to 4 carbon atoms and

(b) mixtures of said alcohols with alkaline reactants selected from the group consisting of alkali metal hydroxides and carbonates,

at a reaction temperature of from 140° C. to 220° C. for a time sufficient to convert substantially all the organic chlorine of the halogenated aromatic compounds in the still bottoms into inorganic chloride, and recovering the still bottoms virtually free of chlorinated dibenzo-p-dioxins

(2) substantially dissolving the still bottoms virtually free of chlorinated dibenzo-p-dioxins in water,

(3) extracting the aqueous mass with an organic solvent for chlorinated dibenzo-p-dioxins immiscible in water,

(4) discharging the extracted aqueous mass vitually free of chlorinated dibenzo-p-dioxins,

(5) recycling said organic solvent extract to step (1), and

(6) recovering said organic solvent from said reaction step 1 by distillation and condensation.

11. A method for the reduction of the content of chlorinated dibenzo-p-dioxins adsorbed on a solid adsorbent to virtually zero consisting essentially of contacting said solid adsorbent with an aromatic organic liquid at a temperature of between 80° C. and 220° C. for a time sufficient to desorb and dissolve substantially all of said chlorinated dibenzo-p-dioxins, reacting said aromatic organic liquid containing chlorinated dibenzo-p-dioxins with an amount, in excess of stoichiometrical based on the total organic halogen content, of alkaline reactants selected from the group consisting of

(1) alkali metal alcoholates of alcohols selected from the group consisting of alkanols having from 1 to 5 carbon atoms, polyalkoxyalkane glycols having from 4 to 20 carbon atoms, alkanepolyols having from 2 to 5 carbon atoms and 2 to 3 hydroxyls, and monoalkyl ethers of said alkane polyols with alkanols having from 1 to 4 carbon atoms, and

(2) mixtures of said alcohols with alkaline reactants selected from the group consisting of alkali metal hydroxides and carbonates,

at a reaction temperature of from 140° C. to 220° C. for a time sufficient to convert the organic halogen into inorganic halide, and recovering a aromatic organic liquid virtually free of chlorinated dibenzo-p-dioxins.

4,327,028

COMPOSITION OF MATTER

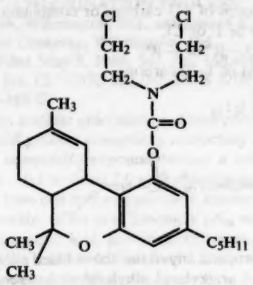
Norman C. Kaplan, Del Mar, Calif., assignor to Calcol, Inc., Cleveland, Ohio

Filed Aug. 17, 1978, Ser. No. 934,465

Int. Cl.³ C07D *311/78*

U.S. Cl. 260—345.3 **1 Claim**

1. Δ-9-N,N-Bis-dichloroethyl carbamate Tetrahydrocannabinol having the formula:



4,327,029

ANTHRACYCLINE DERIVATIVES, THEIR PREPARATION AND USE

Luigi Bernardi, Milan; Paolo Masi, Milan; Antonino Suarato, Milan, and Federico Arcamone, Nerviano, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

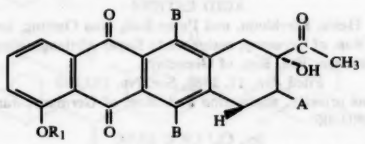
Division of Ser. No. 850,933, Nov. 14, 1977, Pat. No. 4,166,848. This application Jan. 8, 1979, Ser. No. 2,072

Claims priority, application United Kingdom, Nov. 16, 1976, 47601/76

Int. Cl.³ C07C *39/40*

U.S. Cl. 260—351.1 10 Claims

1. A compound of the formula:



wherein R_1 is a C_2–C_4 alkyl; a C_3–C_6 cycloalkyl or benzyl; A and B are OH or A and B are $OCOOR_4$ or B is OH and A is $OCOOR_4$; and R_4 is alkyl.

4,327,030

PROCESS FOR REDUCING THE POLYUNSATURATES CONTENT IN MIXTURES OF UNSATURATED FATTY ACIDS AND/OR FATTY ACID ESTERS

Kenneth R. McVay, Fairfield; Stephen C. Lakes, and Karl T. Zilch, both of Cincinnati, all of Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Feb. 13, 1981, Ser. No. 234,280

Int. Cl.³ C11C *3/00*

U.S. Cl. 260—407 14 Claims

1. A process for reducing the amount of polyunsaturated fatty acid and/or polyunsaturated fatty acid ester present in admixture with monounsaturated fatty acid and/or monounsaturated fatty acid ester which comprises heating the admixture of fatty acids and/or fatty acid esters in the presence of a polymerization initiating amount of at least one organic peroxide polymerization initiator at a temperature and for a period of time which is sufficient to effect the selective polymerization of a substantial amount of polyunsaturated fatty acid and/or polyunsaturated fatty acid ester present in said admixture, and thereafter separating the polymerized polyunsaturated fatty acid and/or polyunsaturated fatty acid ester from said admixture.

4,327,031

ANTI-SOLAR COSMETIC COMPOSITION

Claude Bouillon, Eaubonne; Charles Vayssie, Aulnay-sous-Bois, and Francoise Richard, Montreuil-sous-Bois, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 947,152, Sep. 29, 1978, Pat. No. 4,250,108, which is a division of Ser. No. 497,469, Aug. 14, 1974, Pat. No. 4,165,336, which is a continuation-in-part of Ser. No. 440,570, Feb. 7, 1974, abandoned. This application Aug. 29, 1980, Ser. No. 182,759

Claims priority, application Luxembourg, Feb. 19, 1973, 67061

The portion of the term of this patent subsequent to Aug. 21, 1996, has been disclaimed.

Int. Cl.³ C07C *123/00;* C07F *3/06;* C07C *143/24*

U.S. Cl. 260—429.9 9 Claims

5. The zinc salt of (2-oxo-3-bornylidene methyl) benzene sulfonic acid produced by reacting benzylidene camphor with oleum at a temperature not exceeding 50° C., and reacting the reaction mixture with an effective amount of zinc carbonate so as to produce said zinc salt.

4,327,032

ACICULAR ALUMINIUM SALTS OF CARBOXYLIC ACIDS AND PROCESSES FOR THEIR PREPARATION

Friedrich Lohse, Oberwil; Rolf Schmid, Gelterkinden, and Willy Fatzer, Bottmingen all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

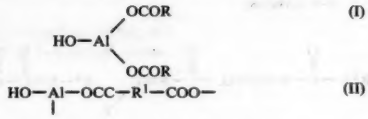
Filed Jan. 4, 1980, Ser. No. 109,716

Claims priority, application Switzerland, Jan. 16, 1979, 403/79; Jan. 16, 1979, 404/79

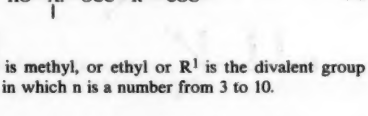
Int. Cl.³ C07F *5/06*

U.S. Cl. 260—448 R 8 Claims

1. An acicular to rod-shaped aluminium monohydroxide salt of a carboxylic acid, which salt is free from water of crystallisation and has the formula I or contains the structural element of the formula II, or mixtures of these salts,



(I)



(II)

in which R is methyl, or ethyl or R^1 is the divalent group $-C_nH_{2n}-$, in which n is a number from 3 to 10.

4,327,033

PROCESS FOR THE PRODUCTION OF METHOMYL OXIME

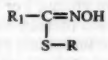
Joseph T. Blackwell, III, Greensboro, N.C., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,811

Int. Cl.³ C07C *119/16*

U.S. Cl. 260—453.3 4 Claims

1. In the process for the manufacture of alkylthio hydroxamates of the formula:



where R_1 is lower alkyl or lower methoxyalkl; and R_2 is lower alkyl or lower cyanoalkyl by chlorinating an aldoxime of the formula:

at a temperature range of −10° C. to 0° C. to form an alkylhydroxamic acid chloride of the formula

and then thioesterifying said alkylhydroxamic acid chloride at a temperature range of about 0° C. to 10° C. at a pH in the range 6–7, the improvement which comprises employing N-methylpyrrolidone as solvent in both reaction steps.

4,327,034

SULFAMIC ACID HALIDES AND PROCESSES FOR THE PREPARATION OF SULFAMIC ACID HALIDES

Gerhard Hamprecht, Weinheim; Adolf Parg, Bad Durkheim, and Karl-Heinz Koenig, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

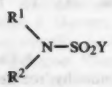
Filed Jun. 25, 1979, Ser. No. 51,743

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1978, 2828969; Mar. 23, 1979, 2911456

Int. Cl.³ C07C *155/02, 79/44, 143/12, 125/06*

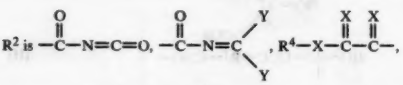
U.S. Cl. 260—455 A **8 Claims**

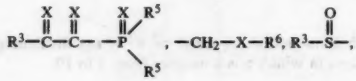
1. A sulfamic acid halide of the formula

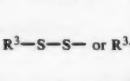


wherein,

R^1 is a straight or branched alkyl of 1–20 carbons being unsubstituted or substituted by halogen, or a cycloalkyl of 4–8 carbons;







R^3 and R^4 are each an alkyl of 1–20 carbons being unsubstituted or substituted by 1 or 2 halogen atoms, 1 or 2 alkoxy groups of 1–4 carbons or combination thereof, a straight or branched alkenyl or alkynyl of 2–20 carbons being unsubstituted or substituted by 1 or 2 halogen atoms, 1 or 2 alkoxy groups of 1–4 carbons or combination thereof, a cycloalkyl of 4–8 carbons being unsubstituted or substituted by a chlorine atom, an aralkyl or alkylaryl of 7–12 carbons being unsubstituted or substituted by 1 or 2 halogen atoms, 1 or 2 nitro groups, 1 or 2 alkoxy groups of 1–3 carbons or combination thereof, an aryl of 6–12 carbons being unsubstituted or substituted by 1 or 2 halogen atoms, 1 or 2 nitro groups, 1 or 2 alkoxy groups of 1–3 carbons or combination thereof, a heterocyclic radical having 5 or 6 members containing 1 or 2 nitrogen atoms, an oxygen atom or combination thereof being unsubstituted or substituted by 1 or 2 halogen atoms, 1 or 2 nitro groups, 1 or 2 alkoxy groups of 1–3 carbons or combination thereof;

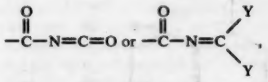
R^3 may also be F or Cl;

R^5 is Cl, —X—R^6 or —R^6;

R^6 is an alkyl of 1–20 carbons;

X is O or S;

Y is Cl or if R^2 is



then Y is halogen, and any of the above listed alkyl, cycloalkyl, alkenyl, alkynyl, aralkylaryl, alkylaryl, or heterocyclic radicals may also be substituted with an alkyl of 1–4 carbons, a carbalkoxy of 2–4 carbons or a chlorocarbonyl, with the proviso that when R^2 is —CH_2—X—R^6, then R^1 is alkyl or cycloalkyl as defined above which are halogen free in the β-position to the nitrogen and X is S; when R^2 is

then R^1 is a cycloalkyl of 4–8 carbons or an alkyl of 1–20 carbons substituted by halogen.

4,327,035

PROCESS FOR THE PREPARATION OF CARBONIC ACID ESTERS

Walter Heitz, Kirchhain, and Peter Ball, Neu Oetting, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

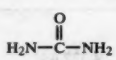
Filed Jan. 17, 1980, Ser. No. 112,893

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1979, 2903506

Int. Cl.³ C07C *68/00*

U.S. Cl. 260—463 **3 Claims**

1. Process for the preparation of carbonic acid esters of monoalcohols or polyalcohols characterized in that ureas of the formula



are reacted with C_1–C_{20} monoalcohols or with C_5–C_{20} polyalcohols in the molar ratio of at least 1:2 in the presence of a catalyst selected from the group consisting of

(i) saltlike or covalent compounds of main groups 1 and 2 and subgroups 1, 2, 3, 4, 5, 6, 7 and 8 of the Periodic Table of the elements;

(ii) orthostannates, amines, phosphines, phosphineoxides, thioethers, thiolates, $B(-O-C_6H_5)_3$, $B(C_6H_5)_3$ and $Al(OR)_3$ where R is an aliphatic or an aromatic hydrocarbon radical;

(iii) saltlike or covalent compounds of main groups 4, 5, and 6 in combination with any of (i) or (ii);

(iv) combination of any member of (i) with any other of (i) or (ii);

(v) combination of any member of (ii) with any other of (ii);

said catalyst amounting to between about 10^{-3} and 5 mol percent relative to the number of mols of said urea, said combinations characterized in that they combine electron donors and electron acceptors at reaction temperatures between 120° and 270° C. and at a reaction time of 5 to 10 hours.

4,327,036

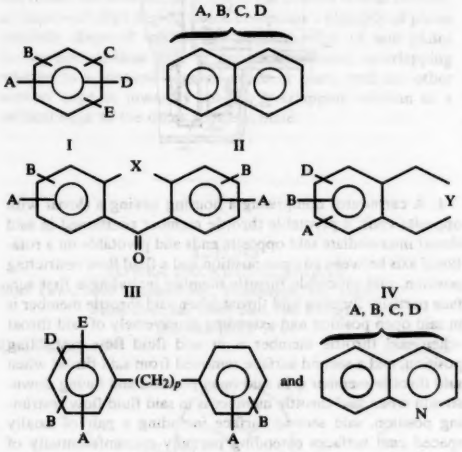
CHLORINATION PROCESS

Frank D. Marsh, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 8, 1980, Ser. No. 148,006
Int. Cl.[3] C07C *121/50*; C07B *9/00*
U.S. Cl. 260—465 G 16 Claims

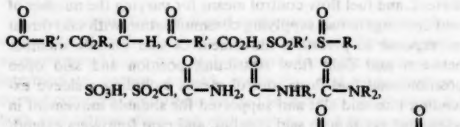
1. Process for nuclear chlorination of non-phenolic aromatic compounds, said process comprising contacting and reacting a non-phenolic aromatic compound having a net Hammett σ value of about -0.1 to about 2.0 with chlorine monoxide in the presence of at least one half an equivalent amount, based on the chlorine monoxide, of an acid having a pK_a no greater than that of trichloroacetic acid, provided, however, when the net Hammett σ value is about 0.7 to about 2.0, the acid has a pK_a no greater than that of trifluoroacetic acid.

5. Process for nuclear chlorination of non-phenolic aromatic compounds, said process comprising contacting and reacting a non-phenolic aromatic compound having a net Hammett σ value of about -0.1 to about 2.0 with chlorine monoxide in the presence of at least one half an equivalent amount, based on the chlorine monoxide, of an acid having a pK_a no greater than that of trichloroacetic acid, provided, however, when the net Hammett σ value is about 0.7 to about 2.0, the acid has a pK_a no greater than that of trifluoroacetic acid, said non-phenolic aromatic compound being of the formula selected from the group consisting of



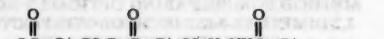
wherein:

each of A and B is independently selected from H, OR, OCF_3, NH_2, NR_2, $NR_3^{\oplus}$, $PR_3^{\oplus}$, NO_2, CN, F, Cl, Br, I, CZ_3,



perfluoroalkyl of 1–8 carbon atoms, alkyl of 1–10 carbon atoms and alkyl of 1–10 carbon atoms substituted with any of the foregoing except H, perfluoroalkyl and alkyl;

C is H, OR, Cl, Br, F, CZ_3,



or alkyl of 1–10 carbon atoms;

D is H or Cl;

E is H or Cl;

R is alkyl of 1–10 carbon atoms or aryl;

R' is alkyl of 1–10 carbon atoms, aryl or CZ_3;

X is

or $(CH_2)_n$;

Y is $(CH_2)_m$;

each Z is independently selected from Cl, Br, and F;

m is 3–6;

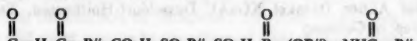
n is 0–3; and

p is 0–10,

provided, however, in III and V each of A and B is selected independently.

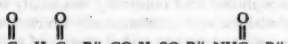
10. Process of claim **5** wherein: the non-phenolic compound is of formula I;

A is selected from H, OR", NH_2, $NR"_2$, NO_2, CN, Cl, CF_3, CCl_3, $CO_2R"$,



and alkyl of 1–4 carbon atoms;

B is selected from H, OR", $NR"_2$, NO_2, CN, Cl, CF_3, CCl_3, $CO_2R"$,



and alkyl of 1–4 carbon atoms; and

R" is alkyl of 1–4 carbon atoms.

4,327,037

PRODUCTION OF UNSATURATED NITRILES

Robert K. Grasselli, Chagrin Falls; Dev D. Suresh, Warrensville Heights, and Harley F. Hardman, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 430,964, Jan. 4, 1974, Pat. No. 4,139,552.
This application Feb. 27, 1978, Ser. No. 881,313
Int. Cl.[3] C07C *120/14*
U.S. Cl. 260—465.3 1 Claim

1. In the process for the ammoxidation of propylene or isobutylene by contacting propylene, isobutylene or mixtures thereof with molecular oxygen and ammonia in the vapor phase in the presence of a catalyst, the improvement comprising using as the catalyst $Sb_{0.5}Cs_{0.5}Ni_{2.5}Co_{4.5}Fe_3BiMo_{12}O_x$ wherein x is the number of oxygens required to satisfy the valence requirements of the other elements present.

4,327,038
METHOD FOR PREPARING OPTICALLY ACTIVE 2,2-DIMETHYL-3-(2,2-DICHLOROVINYL)CYCLOPROPANECARBOXYLIC ACID

Yukio Suzuki, Toyonaka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 16, 1981, Ser. No. 225,750
Claims priority, application Japan, Jan. 31, 1980, 55-11313
Int. Cl.[3] C07C *61/04*; C07B *19/00*
U.S. Cl. 260—501.16 7 Claims

1. A method for preparing (1R, cis)-2,2-dimethyl-3-(2,2-dichlorovinyl)cyclopropanecarboxylic acid, which comprises reacting 2,2-dimethyl-3-(2,2-dichlorovinyl)-cyclopropanecarboxylic acid containing 70% or more of the cis-form with an equimolar or less amount of (+) -1-phenyl-2-(p-tolyl)ethylamine, allowing a (1R, cis)-2,2-dimethyl-3-(2,2-dichlorovinyl)-cyclopropanecarboxylic acid salt of (+)-1-phenyl-2-(p-tolyl)-ethylamine to precipitate from a solvent, and then decomposing the resulting precipitated salt with a base or an acid to yield (1R, cis)-2,2-dimethyl-3-(2,2-dichlorovinyl)-cyclopropanecarboxylic acid.

7. (+)-1-Phenyl-2-(p-tolyl)ethylammonium (1R, cis)-2,2-dimethyl-3-(2,2-dichlorovinyl)cyclopropanecarboxylate.

4,327,039
PROCESS FOR THE PRODUCTION OF 3-AMINO-1-HYDROXYPROPANE-1,1-DIPHOSPHONIC ACID

Helmut Blum, and Karl-Heinz Worms, both of Dusseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Oct. 1, 1980, Ser. No. 192,733
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943498
Int. Cl.[3] C07C *9/38*
U.S. Cl. 260—502.5 2 Claims

1. A process for the preparation of 3-amino-1-hydroxypropane-1,1-diphosphonic acid consisting essentially of the steps of reacting β-alanine with a substantially stoichiometric to an excess amount with respect to said β-alanine of a phosphonating reactant selected from the group consisting of:

(1) a mixture of phosphorous acid and PCl_5, and

(2) a mixture of phosphorous acid, PCl_3 and Cl_2,

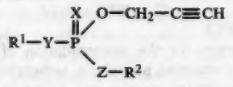
under anhydrous conditions in the presence of a chlorinated hydrocarbon diluent, at a temperature of from 80° C. to 130° C., hydrolyzing the reaction mixture, and recovering said 3-amino-1-hydroxypropane-1,1-diphosphonic acid.

4,327,040
PREPARATION OF PHOSPHORIC ACID PROPARGYL ESTERS

Günter Arend, Dormagen, and Peter Feyen, Mettmann, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 9, 1980, Ser. No. 158,032
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1979, 2926652
Int. Cl.[3] C07F *9/113, 9/173*
U.S. Cl. 260—973 13 Claims

1. A process for the preparation of a phosphoric acid propargyl ester of the formula



wherein

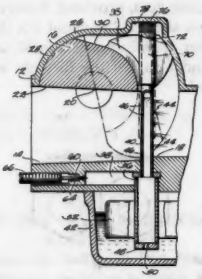
R^1 and R^2 each independently is an aryl radical or a C_{1-4}-alkyl, C_{1-4}-alkenyl or C_{1-4}-alkynyl radical, and

X, Y and Z each independently is oxygen or sulphur, comprising reacting a phosphoric acid monoester chloride or diester chloride with at least the equivalent amount of propargyl alcohol in a two-phase water-organic solvent system in the presence of an aqueous solution of an inorganic base as an acid-trapping agent, and a catalyst comprising about 0.001 to 100 mol %, relative to the phosphoric acid ester chloride, of a tertiary amine or quaternary ammonium or phosphonium salt with at least 9 C atoms.

4,327,041
CARBURETOR HAVING A CONCENTRIC TUBE FUEL SUPPLY

Gene F. Baltz, Lake Villa, and Paul W. Breckenfeld, Winthrop Harbor, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 29, 1980, Ser. No. 173,346
Int. Cl.[3] F02M *9/08*
U.S. Cl. 261—41 B 2 Claims



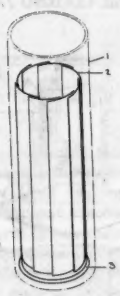
1. A carburetor comprising a housing having a throat with opposite ends, a pivotable throttle member positioned in said throat intermediate said opposite ends and pivotable on a rotational axis between an open position and a fluid flow restricting position, said pivotable throttle member including a first surface partially forming said throat when said throttle member is in said open position and extending transversely of said throat when said throttle member is in said fluid flow restricting position, and a second surface removed from said throat when said throttle member is in said open position and facing downstream when said throttle member is in said fluid flow restricting position, said second surface including a pair of axially spaced cam surfaces extending partially circumferentially of and transversely of said rotational axis, said second surface also having therein a slot located between said cam surfaces and extending partially circumferentially of and transversely of said rotational axis, means for supplying fuel to said throat intermediate said opposite ends and including a conduit extending into said throat and said slot, said conduit including therein a plurality fuel supply openings spaced along the length thereof, and fuel flow control means for varying the number of said openings in fuel supplying communication with said throat in response to pivotable movement of said throttle member between said fluid flow restricting position and said open position, said fuel flow control means including a sleeve extending into said slot and supported for slidable movement in telescopic relation to said conduit, and cam followers extending fixedly in opposite directions from said sleeve in parallel relation to said rotational axis and in engagement with said cam surfaces, whereby said sleeve is slidable on said conduit in response to pivotable movement of said throttle member to vary the number of openings in fuel supplying communication with said throat.

4,327,042

DRAFT DEVICE FOR A BUBBLE COLUMN

Hiroshi Hagino, Tokyo; Hideo Odagiri, and Junichi Okutani, both of Hofu, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1980, Ser. No. 218,774
Claims priority, application Japan, Dec. 25, 1979, 54-167667
Int. Cl.³ F02M 17/20
U.S. Cl. 261—77 7 Claims



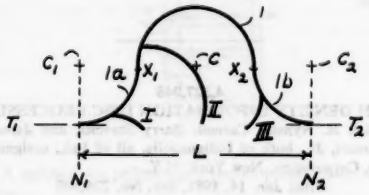
1. In a bubble column for reactions wherein gas and liquid are mixed comprising a cylindrical vertically disposed column and means for introducing a gas to the bottom of said column, an improved draft device which comprises a plurality of plates coaxially disposed within said column; each of said plates having one vertical edge in outwardly spaced, overlapping relation to a vertical edge of adjacent plate, and the other vertical edge in inwardly spaced, overlapping relation to a vertical edge of the other adjacent plate.

4,327,043

TOWER PACKING ELEMENT

Max Leva, 5600 Munhall Rd., Pittsburgh, Pa. 15217

Filed Dec. 22, 1980, Ser. No. 219,311
Int. Cl.³ B01F 3/04
U.S. Cl. 261—94 13 Claims



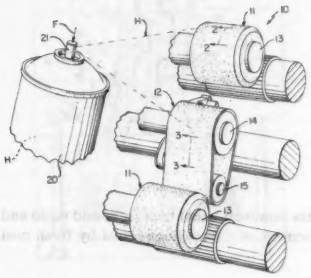
1. In a packing for a gas-liquid contacting tower and the like, a plurality of randomly packed mutually interlocking packing elements providing a bed, each packing element comprising an intermediate portion curved concavely, and end portions curved convexly, slot means formed in said packing element in both said intermediate and end portions, first tongue means depending from said slot means in said concavely-curved intermediate portion and extending away only inwardly from said intermediate portion and second tongue means depending from said slot means in said convexly-curved end portions and extending away from said end portions in only the same general direction from said packing element as said first tongue means.

4,327,044

METHOD OF IMPROVING OUTER PORTION OF A TEXTILE FIBER PROCESSING COMPONENT

John J. Dolan, Blairgowrie, Scotland, and Syd Roocroft, Bolton, England, assignors to Dayco Corporation, Dayton, Ohio

Filed Oct. 24, 1980, Ser. No. 200,169
Int. Cl.³ B29C 25/00
U.S. Cl. 264—36 10 Claims



1. In a method of improving the outer portion of a rotatable textile fiber processing component to define the desired properties of minimum compression set for said outer portion and a working surface which has a comparatively low coefficient of friction, said method comprising the steps of, making said outer portion substantially of butadiene copolymer rubber, subjecting said outer portion to the action of a halogen to define said desired properties, mounting said component on a rotatable support means of a textile processing equipment, and then operating said equipment whereby said outer portion of said component is worked, the improvement comprising the step of applying additional halogen on said outer portion with said component in a stationary position in its working environment in said equipment while supported on said rotatable support means therefor after said outer portion has been worn from said working thereof whereby said outer portion is rejuvenated so that further operation of said equipment can take place with said component again having said desired properties.

4,327,045

COOLING PROCESS SUITABLE FOR FOAM MOLDING OF A SYNTHETIC RESIN AND ITS COOLING APPARATUS

Shigeo Nishikawa, and Masaaki Yokoyama, both of Yokkaichi, Japan, assignors to Yuka Badische Company Limited, Yokkaichi, Japan

Filed Mar. 25, 1980, Ser. No. 133,782
Claims priority, application Japan, Mar. 28, 1979, 54-35428
Int. Cl.³ B29D 27/00
U.S. Cl. 264—51 8 Claims

1. A cooling process for cooling molded foam synthetic thermoplastic resin articles in a cavity in a mold prior to removal from the mold, comprising:

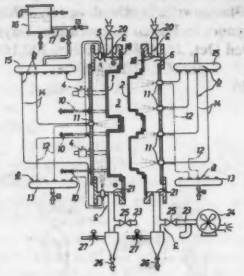
providing a chamber in the mold;

flowing gas at high speed through a plurality of nozzles into said chamber;

introducing cooling water into said gas in said nozzles, said nozzle being effective to disperse said cooling water into mist which fills said chamber and adheres to walls of said mold to remove heat therefrom; and

forcibly suctioning said mist and said gas from said chamber while continuing the steps of flowing and introducing

whereby the step of forcibly suctioning is effective to remove said mist and steam from said chamber after said



mist has removed latent heat from said mold and to permit replacement of the suctioned mist by fresh mist.

4,327,046

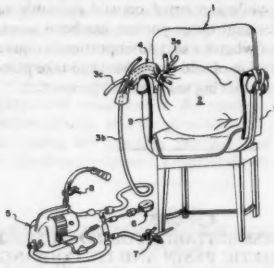
METHOD FOR PRODUCING A RIGID, SHAPED MASS SUPPORT SYSTEM

Thomas A. Davis, Scotch Plains, N.J., and Donald R. Cowsar, Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

Filed Dec. 7, 1979, Ser. No. 101,511

Int. Cl.³ B29J *1/00*; B29D *27/00*; B29C *1/02*

U.S. Cl. 264—102 **9 Claims**



1. A method for producing a rigid, shaped, mass support system comprising:

(A) charging a flexible container made of elastic stretchable polymeric film, with a uniform mixture comprising:

(a) a multiplicity of rigid particles of a mesh size relatively small compared to the size of the system;

(b) a curable adhesive polymeric resin binder material;

(B) molding the charged flexible container to conform to the shape of the mass such as the contour of that portion of a person's body which the system is intended to support;

(C) evacuating the molded charged container to remove volatiles from and fix the shape of said container;

(D) curing the adhesive binder material to solidify the molded contents of the container to form a composite;

(E) removing the polymeric film from the composite obtained in step (D); and

(F) applying a coating which adheres to the surface of the composite obtained in step (E).

4,327,047

METHOD FOR PRODUCING DISC RECORDS HAVING MOLDED-IN CENTER HOLES

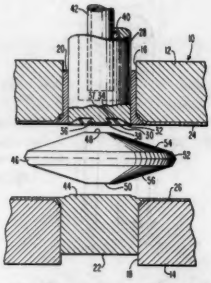
Michael L. McNeely, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 93,012, Nov. 9, 1979. This application Oct. 24, 1980, Ser. No. 200,140

Claims priority, application United Kingdom, Apr. 30, 1979, 14992/79

Int. Cl.³ B29D *17/00*

U.S. Cl. 264—107 **3 Claims**



1. A method of molding an information record with a molded-in center hole comprising the steps of

(a) placing a preform of plastic material between the open mold plates of a mold press with one of the mold plates having a center hole-forming pin, which pin has a recess in its end surface,

(b) heating the mold plates and closing them against the preform to heat the preform and cause the plastic material to flow outwardly and fill the cavity between the mold plates so as to form the record,

(c) directly heating the center hole-forming pin and moving it through the material of the preform to form the center hole with some of the material entering and filling the recess in the pin,

(d) directly cooling each of said mold plates and the center pin to harden the plastic material, and

(e) opening said mold plates and retracting said center hole-forming pin to permit removal of the molded disc, the pin retaining in its recess some of the hardened plastic material.

4,327,048

HIGH DENSITY INFORMATION DISC PROCESSING

Frederick R. Nyman, Carmel; Barry Stevens, and James A. Calamari, Jr., both of Indianapolis, all of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 14, 1981, Ser. No. 224,905

Int. Cl.³ B29D *17/00*

U.S. Cl. 264—107 **16 Claims**

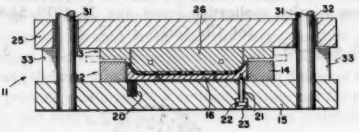
1. In the manufacture of a conductive high density information disc having video and audio information in the form of geometric variations in an information track which can be reconstituted in electrical signal form with a playback stylus, wherein a conductive plastic material is compression molded to form said disc, and said disc is cleaned with an aqueous solution to remove water soluble salts from the surface of said disc, the improvement which comprises treating said disc with an additional high temperature aqueous wash at a temperature of from about 110° to 130° F. for a period of time so as to improve the stability of the surface of the disc with respect to elevated temperature and high relative humidity.

4,327,049

METHOD OF FORMING AUTOMOTIVE HEADLINERS FROM COMPOSITE FOAMED RESIN BLANKS

Frederick O. Miller, 1267 Passolt St., Saginaw, Mich. 48603

Filed Feb. 14, 1980, Ser. No. 121,294
Int. Cl.[3] B29C *17/10*; B29D *27/00*
U.S. Cl. 264—138 8 Claims



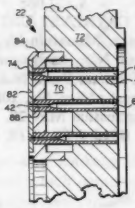
1. A method of forming an article from a substantially uniform thickness blank composed of a first layer of resilient or relatively soft, cellular, foamed thermoplastic material laminated to and sandwiched between a second layer of a relatively stiff, cellular, foamed thermoplastic material and a third layer of fabric, said method comprising heating said blank to an elevated temperature sufficiently high to cause said first and second layers of foamed material to become plastic or tacky but insufficient to melt the material of any of said layers or to damage said fabric; deforming said blank while its temperature remains elevated to the shape of the article to be formed; tapering said blank toward its marginal edges and while its temperature remains elevated by compressing the marginal edges of said blank to reduce the size of the cells of both of said first and second layers of foamed material; and cooling said deformed blank.

4,327,050

EXTRUSION AND PELLETING APPARATUS AND METHOD

Emigdio J. Salmon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 22, 1980, Ser. No. 189,478
Int. Cl.[3] B28B *11/16*
U.S. Cl. 264—142 12 Claims



1. A method for pelletizing a thermoplastic material comprising:

supplying a flow of molten thermoplastic material,

forming said flow of molten material into a plurality of individual streams having substantially equal cross sectional area and substantially equal stream flow velocity at a preselected plane of reference by passing each said stream through a passageway having an upstream portion of a first length and a first relatively large cross sectional area and a downstream portion of a second length and a second relatively small cross sectional area, each said second length being selected from one of at least two different chosen lengths to provide substantially equal stream flow velocity therethrough, and

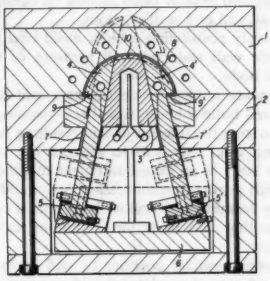
dividing each of said individual streams into substantially equal pellet lengths at said plane of reference.

4,327,051

METHOD OF MOLDING GUTTER FITTINGS

Ronald Edmondson, Otford, United Kingdom, assignor to Plastiers Limited, London, England

Filed Jul. 6, 1978, Ser. No. 922,200
Int. Cl.[3] B29C *7/00*
U.S. Cl. 264—318 9 Claims



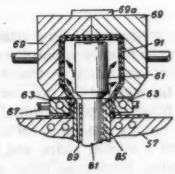
1. A method for molding and releasing from a mold gutter fitting made out of resilient plastic material which fitting comprises a channel shaped body provided with a transverse groove to receive resilient material and having inwardly turned lips extending over the ends of the groove, at least one of the lips being provided on its inner edge with a downwardly turned clipping nib extending over an end of the transverse groove so as to engage a side of a gutter inserted into the fitting, the improved method comprising using a main core and two side cores to mold the gutter fittings, and effecting relative movement between the core and side cores so as to draw the lips together until the stress thereby induced in the fitting causes the lips to spring away from each other to thereby disengage the clipping nib from the cores.

4,327,052

PROCESS FOR MAKING CONTAINERS

Donald G. Sauer, Harwinton, Conn., assignor to National Can Corporation, Chicago, Ill.

Division of Ser. No. 8,607, Feb. 1, 1979, Pat. No. 4,224,275, which is a continuation-in-part of Ser. No. 820,444, Aug. 1, 1977, abandoned, which is a continuation of Ser. No. 615,813, Sep. 22, 1975, abandoned. This application Sep. 23, 1980, Ser. No. 189,751
Int. Cl.[3] B29C *17/04*
U.S. Cl. 264—512 11 Claims



1. A process for plastic container manufacture comprising the steps of:

(A) clamping an outer portion of a preformed thermoplastic member positioned adjacent a female forming means,

(B) relatively projecting a first male forming means into a face of said thermoplastic member to stretch and form said thermoplastic member into a hollow article having an opening and integral side wall and end wall portions.

(C) removing said hollow article from said female forming means and said first male forming means,

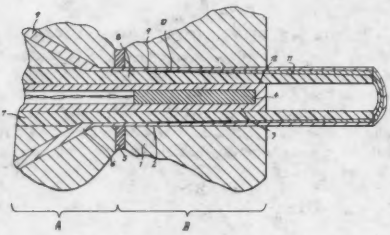
(D) relatively positioning said hollow article in operative relationship to a second male forming means,
(E) positioning a container neck forming means around at least a portion of said side wall,
(F) clamping said side wall between said neck forming means and said second male forming means,
(G) projecting said second male forming means within said hollow article to stretch and form said hollow article into an elongated hollow body having an opening an integral side wall and end wall portions,
(H) relatively positioning a blow mold cavity means about said side wall and end wall portions of said elongated hollow body,
(I) positioning sealing means adjacent said opening of said elongated hollow body to seal said opening,
(J) pressurizing the interior of said resulting hollow body by injecting fluid thereinto to enlarge the volume of said hollow body to an extent sufficient to generally conform said wall portions against said blow mold cavity means thereby forming said hollow body into a container,
(K) separating said blow blow molding cavity from said container,
(L) trimming residual portions of said preformed member from said container adjacent said opening, and
(M) removing said formed container.

4,327,053

BLOW MOLDING HOLLOW ARTICLES FROM POLYOLEFINS CONTAINING ANISOTROPIC FILLER

Frederic N. Cogswell, and David T. Mitchell, both of Welwyn Garden City, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 831,668, Sep. 8, 1977, abandoned. This application Mar. 23, 1979, Ser. No. 24,434
Claims priority, application United Kingdom, Aug. 23, 1977, 35263/77; Mar. 23, 1978, 11677/78
Int. Cl.³ B29C *17/07*
U.S. Cl. 264—515 **3 Claims**



1. A method for producing hollow articles from a polyolefin containing anisotropic filler in which the ratio of filler to polyolefin is at least 15:85 and not more than 4:6 by weight, and the filler is dispersed throughout the polyolefin comprising:
extruding said filled polyolefin, initially in a molten state, through a die having a mandrel for constraining said filled polyolefin into a tubular shape and producing thereby a tubular extrudate having an outer surface and an inner surface, coextruding between the die and the outer surface of said filled polyolefin, a liquid having a freezing temperature lower than that of polymeric material, cooling the liquid and the outer surface of said filled polyolefin during their passage through the die, to a temperature below the freezing temperature of said polyolefin but above the freezing temperature of the liquid to thereby form a stiff skin at the outer surface of said filled polyolefin, while maintaining the inner surface of said filled polyolefin molten, squeezing the extrudate at suitable intervals to fuse the molten inner surface together and thereby seal discrete lengths, and inflating the sealed lengths to conform to a surrounding mould, thereby to produce the shaped article.

4,327,054

GAS SENSOR ASSEMBLY

Eturo Yasuda, Okazaki, and Minoru Ohta, Anjo, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 19, 1979, Ser. No. 105,120
Claims priority, application Japan, Jan. 25, 1979, 54-8492[U]
Int. Cl.³ G01N *27/12*
U.S. Cl. 422—95 **3 Claims**

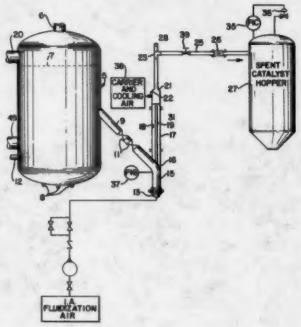
1. A gas sensor assembly comprising:
a first and a second sinter separated from each other by a space and each composed of a metal oxide having an electric resistance value varying in dependence on the composition and temperature of a detected gas, said first sinter having deposited thereon a catalyst for causing an oxidation reaction of the components of said detected gas;
a first and a second electrode both of which extend through and are connected to both of said first and second sinters, respectively, to support the same in an opposing spaced relation; and
a third electrode connected only to said second sinter in such a manner that said third electrode is apart from said first and second electrodes,
whereby a change in the electric resistance value of said first sinter which is temperature compensated by said second sinter can be detected.

4,327,055

CONTINUOUS CATALYST UNLOADING DEVICE

Edward C. Luckenbach, Mountainside, and Arthur C. Worley, Mt. Tabor, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 108,558, Dec. 31, 1979, abandoned. This application May 28, 1981, Ser. No. 267,738
Int. Cl.³ B01J *4/00, 8/18;* **F27B** *15/08*
U.S. Cl. 422—110 **9 Claims**



1. A continuous catalyst regeneration system for use in a hydrocarbon processing system comprising:

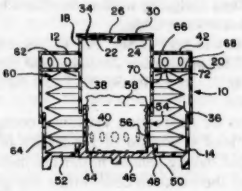
(a) a regeneration vessel;
(b) a spent catalyst hopper;
(c) a discharge conduit for removing catalyst downwardly from said vessel, said discharge conduit having a bent portion in a lower end thereof;
(d) valve means disposed in a mid-portion of said conduit for closing said discharge conduit;
(e) a substantially vertically oriented carrier pipe connected to the top of said bent portion of said discharge conduit for conveying catalyst from said discharge conduit to said hopper, said carrier pipe having a dual purpose refractory lining therein, which reduces the internal diameter thereof to provide a catalyst flow restriction zone and for providing said restriction zone with an erosion resistant inner surface;
(f) a fluidization means connected to a bottom section of said discharge conduit for introducing fluidization air into said carrier pipe at a substantially constant flow rate for facilitating the conduction of catalyst material through said carrier pipe;
(g) a transport pipe connected between said carrier pipe and said hopper;
(h) means for introducing carrier and cooling air into said transport pipe, and
(i) a pressure control means disposed downstream of said restriction zone controlling in combination with said restriction zone the flow rate of the catalyst and air to said spent catalyst hopper, said pressure control means venting said air as said spend catalyst settles in said hopper.

4,327,056

DEODORANT DISPENSER

Conrad J. Gaiser, P.O. Box 534, Zephyr Cove, Nev. 89448

Filed Oct. 9, 1980, Ser. No. 195,599
Int. Cl.³ A61L 9/12
U.S. Cl. 422—124 **12 Claims**



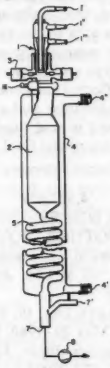
1. A deodorant dispensing package for static and forced dispensing of a deodorant which comprises:
(a) first and second telescoping movable housing members defining a closed chamber;
(b) internal walls dependent therefrom defining inner and outer compartments within said closed chamber;
(c) a deodorant composition within said closed chamber;
(d) first port means in said housing members venting said inner compartment externally of said housing;
(e) second port means in said housing communicating between said inner and outer compartments;
(f) a deodorant vaporization surface wetted with said deodorant composition located within said inner compartment between said first and second port means;
(g) third port means in said housing members venting said outer compartment externally of said housing;
(h) resilient means biasing said first and second housing members into an expanded position; and
(i) means limiting venting of said outer compartment through said third port means whereby the telescopic movement of said members forces air from said package.

4,327,057

APPARATUS FOR THE COMBUSTION OF HARMFUL GASES

Rolf Brüning, Bruchköbel, and Jürgen Roth, Maintal, both of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Filed Oct. 8, 1980, Ser. No. 195,162
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1979, 7929723[U]
Int. Cl.³ F01N 3/04, 3/26, 3/34, 3/38
U.S. Cl. 422—173 **6 Claims**



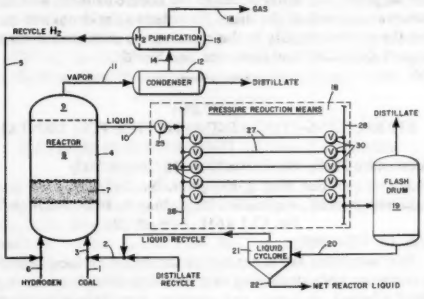
1. An apparatus for the oxidative combustion of harmful gases comprising a vertically disposed cooling jacket provided with a coolant inlet and a coolant outlet, a combustion chamber surrounded by said cooling jacket and a condenser connected to said combustion chamber and disposed therebeneath, a flushing device disposed above said combustion chamber and in gaseous communication therewith, said flushing device being arranged and constructed to wet the inside surface of said combustion chamber with a film of liquid, a burner disposed above said flushing device and in gaseous communication with said flushing device and an electrical igniter disposed between said flushing device and said burner.

4,327,058

CAPILLARY PROCESSING UNIT

John A. Tillinghast, North Hampton, N.H., assignor to Wheelabrator-Frye, Inc., Hampton, N.H.

Filed Jul. 8, 1980, Ser. No. 167,159
Int. Cl.³ B01J 3/02, 3/04, 8/02; C10G 1/00
U.S. Cl. 422—232 **6 Claims**



1. A system for the manufacture of synthetic hydrocarbon products from a solid carbonaceous feed, said system comprising:

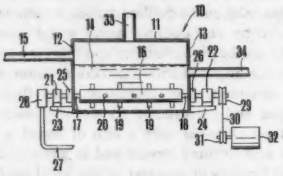
(a) treatment means for converting said solid carbonaceous feed into at least one fluid hydrocarbon stream at an elevated temperature and pressure;
(b) product recovery means for recovering a fluid hydrocarbon product at a pressure lower than that of said fluid stream coming from said treatment means;
(c) conduit means in communicating relationship with said treatment means and said product recovery means; and
(d) reducing means located in said conduit means for reducing the corrosion in said conduit means as said fluid hydrocarbon stream passes therethrough and for reducing the pressure of said stream, said reducing means comprising at least one elongated tube defining a fluid flow passage having a transverse area that is substantially smaller than that of said conduit means at the point where said conduit means is connected to said reducing means, the reduction in pressure being effected substantially entirely be friction of the fluid within said tube, and valve means for isolating the flow of said fluid in said tube without effecting substantial pressure drop of the fluid.

4,327,059

APPARATUS FOR DISPERSING A LIQUID INTO ANOTHER LIQUID

Kensuke Fujimura; Naomichi Yamamoto; Masahiro Ogawa, and Nobuyoshi Tanigawa, all of Ube, Japan, assignors to UBE Industries Ltd., Japan

Division of Ser. No. 105,014, Dec. 19, 1979, Pat. No. 4,291,549. This application May 29, 1980, Ser. No. 154,427
Claims priority, application Japan, Feb. 7, 1979, 54-12277
Int. Cl.³ B01D *11/04*
U.S. Cl. 422—259 **1 Claim**



1. A device for dispersing one liquid into another liquid comprising, a container for holding a quantity of one of the liquids, a hollow drum having an outer cylindrical surface rotatably mounted in the container, a plurality of spaced hollow pipe stems extending outwardly of said drum surface each having a nozzle orifice at an end thereof smaller in diameter than an interior of its hollow pipe stem, whereby a pressure differential is established in said pipe stem with respect to said container, another liquid supply means connected to the drum for supplying the other liquid to the nozzle orifices, and drive means connected to the drum for rotating the drum and moving the nozzles rapidly in the container to increase the dispersion of the other liquid into the one liquid.

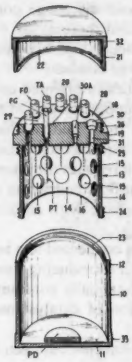
4,327,060

STERILIZING-CONTAINING DEVICE FOR DENTAL TOOLS

Alessandro Nisii, Via Vallombrosa 18, Rome, Italy

Filed May 2, 1980, Ser. No. 145,966
Claims priority, application Italy, May 8, 1979, 48978 A/79
Int. Cl.³ A61L *2/06, 2/18*
U.S. Cl. 422—300 **12 Claims**

1. A sterilizing container device for dental tools comprising: a container body consisting of a first supporting part having a head adapted to locate and support dental tools separately thereon and a second receiving part adapted to receive and support said first part in a first position wherein the latter is received within said second part and means sealingly securing said parts in said first position wherein only said head is outside said receiving part, and a second position wherein substantially all of said supporting part extends upwardly from the upper



end of said receiving part; and a closure cap closing said head and being sealingly secured to said first part over said head in an airtight manner.

4,327,061

METHOD OF STABILIZING WET PROCESS PHOSPHORIC ACID FOR SOLVENT EXTRACTION

John A. Hermann, Oklahoma City, Okla., and Michael F. Lucid, Houston, Tex., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 13,546, Feb. 21, 1979, abandoned. This application Jun. 30, 1980, Ser. No. 164,583
Int. Cl.³ B01D *11/00;* **C01G** *56/00;* **C22B** *60/02;* **C01B** *25/16*
U.S. Cl. 423—8 **9 Claims**

1. A process for recovering vanadium comprising:
treating at least a portion of a quantity of aqueous phosphoric acid having soluble impurities including vanadium associated therewith to concentrate the same and provide a quantity of concentrated aqueous phosphoric acid in which at least a portion of said soluble impurities associated therewith are supersaturated;
contacting at least a portion of said concentrated aqueous phosphoric acid containing said supersaturated soluble impurities with a crystal seed bed consisting of impurities similar to the soluble impurities associated with said aqueous phosphoric acid to cause at least a substantial portion of said supersaturated soluble impurities to precipitate;
separating said precipitated impurities from said concentrated aqueous phosphoric acid and the remaining unprecipitated soluble impurities including vanadium;
providing an aqueous diluent;
admixing said concentrated aqueous phosphoric acid and the remaining unprecipitated soluble impurities with said aqueous diluent to form a diluted solution;
contacting said diluted solution with an organic extractant to selectively extract vanadium from the remaining unprecipitated soluble impurities without the substantial precipitation of any other of the remaining soluble impurities; and
recovering said vanadium selectively extracted by said organic extractant.

4,327,062

PROCESS FOR PRODUCING CHLORIDE OF ELEMENTS OF GROUP III, IV OR V OF PERIODIC TABLE

Tadashi Iwai; Hisayuki Mizuno, and Masao Miura, all of Ube, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Feb. 4, 1981, Ser. No. 231,462
Claims priority, application Japan, Feb. 13, 1980, 55-15493; Jul. 15, 1980, 55-95692
Int. Cl.³ C01B 9/02
U.S. Cl. 423—292 18 Claims

1. A process for producing the chloride of an element selected from the group consisting of boron, silicon, zirconium and vanadium comprising the steps of:

(i) impregnating activated carbon particles with an aqueous solution of at least one compound, other than the chloride, of said element;

(ii) heating the activated carbon particles having a supported aqueous solution of said compound thereon at a temperature of 300° through 1000° C. in an inert gas atmosphere; and,

(iii) reacting the resultant activated carbon particles with chlorine.

4,327,063

METHOD OF PURIFYING CYCLIC DICHLOROPHOSPHAZENES CONTAINING TRACE AMOUNTS OF PROTIC IMPURITIES

John W. Fieldhouse, Mogadore, and Daniel F. Graves, Clinton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 25, 1980, Ser. No. 181,028
Int. Cl.³ C01B 25/10
U.S. Cl. 423—300 17 Claims

1. A method of purifying a cyclic dichlorophosphazene containing trace amounts of protic impurities which comprises the steps of:

(a) heating said cyclic dichlorophosphazene in a reactor to a temperature of from 115° C. to 150° C.;

(b) adding a gaseous or liquid boron trihalide to the reactor in an amount in excess of the amount of protic impurities present in the cyclic dichlorophosphazene, while maintaining the temperature of the reactor below 150° C.;

(c) pressurizing said reactor with an inert gas to an internal pressure which is sufficient to permit intimate contact between the cyclic dichlorophosphazene and the boron trihalide;

(d) agitating the contents of the reactor for a sufficient time to permit reaction of substantially all of the protic impurities in the cyclic dichlorophosphazene with the boron trihalide; and

(e) purging said reactor with said inert gas to remove the products formed from the reaction of said protic impurities and said boron trihalide and excess boron trihalide, thereby producing a cyclic dichlorophosphazene which is substantially free of protic impurities.

4,327,064

SOLUTION POLYMERIZATION OF CYCLIC DICHLOROPHOSPHAZENE OLIGOMERS IN CYCLOALIPHATIC SOLVENTS

John W. Fieldhouse, Mogadore, and Steven L. Fenske, Uniontown, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 4, 1980, Ser. No. 174,765
Int. Cl.³ C01B 25/10
U.S. Cl. 423—300 9 Claims

1. A solution polymerization process for producing substantially linear ungelled polydichlorophosphazene polymers having a degree of polymerization of from 20 to 50,000 which comprises:

(a) polymerizing substantially pure cyclic oligomers represented by the formula $(NPCl_2)_n$, in which n is from 3 to 7, in solution in a cycloaliphatic hydrocarbon solvent at a temperature of from about 150° C. to about 300° C. for a period of from 4 to 30 hours in the presence of a catalyst selected from the group consisting of boron trihalides and complexes of boron trihalides with oxygenated phosphorus compounds; and

(b) recovering the resultant polymer.

4,327,065

METHOD OF PREPARING SILICA AEROGEL

Guy von Dardel, Gyllenkroks Alle 19, S-222 24 Lund; Sten A. Henning, Herdevägen 2, and Leif O. G. Svensson, Dekanvägen 7, both of S-240 10 Dalby, all of Sweden

Filed Apr. 22, 1980, Ser. No. 142,812
Claims priority, application Sweden, Apr. 30, 1979, 7903766
Int. Cl.³ C01B 33/158
U.S. Cl. 423—338 6 Claims

1. A method of preparing silica aerogel in the form of a moulded substantially crack-free block comprising the steps of hydrolyzing a silicic acid ester dissolved in an alcohol with water added thereto, in a mould adapted to the desired dimensions, to form a silica alcogel, said hydrolysis being carried out at or below room temperature, washing and aging the alcogel for a period of 2 to 20 days, said washing being performed with an alcohol to remove water from said alcogel, then converting said alcogel to an aerogel by placing it in a closed pressure vessel with alcohol in an amount to at least reach the critical temperature and pressure thereof, subjecting the alcogel-alcohol mixture to a treatment consisting of heating the mixture above the critical point of the alcohol at a mean rate not exceeding 25° C./hr., releasing the alcohol vapor from said vessel to reduce the pressure isothermally at a mean rate not exceeding 10 bars/hr. to atmospheric pressure and then lowering the temperature in said vessel at a mean rate not exceeding 75° C./hr. to ambient temperature, wherein the duration of the treatment in said pressure vessel is at least 24 hours.

4,327,066

METHOD OF PREPARING SILICON CARBIDE

Motoo Seimiya, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 25, 1980, Ser. No. 162,819
Claims priority, application Japan, Nov. 14, 1979, 54/146498
Int. Cl.³ C01B 31/36
U.S. Cl. 423—345 11 Claims

1. A method of producing β-silicon carbide which comprises heating solid silica in a gas atmosphere consisting essentially of a gas feed of hydrocarbon gas and hydrogen gas wherein the silica is heated to a temperature of 1200° C. to 1600° C. and the volume ratio of hydrogen (H_2)/hydrocarbon (methane equivalent) is between 1 and 100.

2. A method of producing β-silicon carbide which comprises heating solid silica in a gas atmosphere consisting essentially of a gas feed of hydrocarbon gas, hydrogen gas and a diluent gas, wherein the volume ratio of diluent gas/hydrocarbon is between 0.1 and 50, wherein the silica is heated to a temperature of 1200° C. to 1600° C. and the volume ratio of hydrogen (H_2)/hydrocarbon (methane equivalent) is between 1 and 100.

4,327,067

METHOD FOR REFINING METAL CARBIDES CONTAINING FREE CARBON

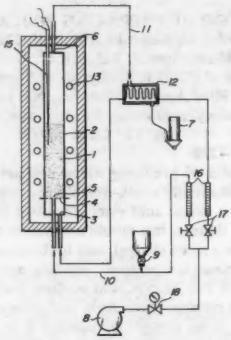
Kunio Kato, Kiryu; Yoshiki Sugiyama, Gifu, and Ryo Enomoto, Ohgaki, all of Japan, assignors to Ibigawa Electric Industry Co., Ltd., Ohgaki, Japan

Filed Jan. 2, 1980, Ser. No. 109,114
Claims priority, application Japan, Jan. 18, 1979, 54-3337
Int. Cl.³ C01B 31/30, 31/34, 31/36
U.S. Cl. 423—345 5 Claims

1. A method of refining metal carbide powders of average grain size of not more than 200μ containing free carbon, comprising:

producing a fluidizing bed made up of heat resistant particles selected from the group consisting of silica, alumina, mullite, magnesia, zirconia, zircon sand and silicon carbide having an average grain size of 150–500μ by means of an oxidizing gas which has a bed height at minimum fluidizing gas velocity within a range of 0.2–3.0 m;

charging metal carbide powders which are finer than the heat resistant particles from a lower part of the fluidizing bed;



burning the free carbon during floatation and rise of the metal carbide powders in the fluidizing bed at a temperature of 800°–1.100° C. without substantial oxidation of the metal carbide; and

subsequently scattering and discharging refined metal carbide powders together with combustion gas from an upper part of the fluidizing bed for recovery of the refined powders, said metal carbide powders being at least one of the carbides of silicon, titanium, tantalum, niobium, tungsten and vanadium.

4,327,068

METHOD AND THE REUSE OF SEWAGE WATERS OF THE COMBINED UREA-AMMONIA INSTALLATIONS

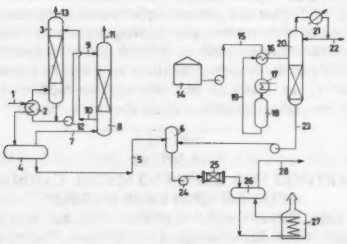
Vincenzo Lagana, Milan, and Umberto Zardi, San Donato Milanese, both of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Continuation of Ser. No. 162,425, Jun. 24, 1980, abandoned, which is a continuation of Ser. No. 791,331, Apr. 27, 1977, abandoned. This application Feb. 13, 1981, Ser. No. 234,159

Claims priority, application Italy, May 14, 1976, 23296 A/76

Int. Cl.³ C01C *1/04*

U.S. Cl. 423—359 **2 Claims**



1. In a multistage process for producing urea, including a first stage for the production, from a gaseous mixture of hydrogen, nitrogen, CO_2 and H_2O from steam reforming, of a mixture of hydrogen and nitrogen for use as a feed in the synthesis of ammonia, in which water in said gaseous mixture is condensed as a first aqueous condensate, said first aqueous condensate is separated from the gases therein and CO_2 is then separated from said gases as a feed in urea synthesis, a second stage for the synthesis of ammonia from the mixture of hydrogen and nitrogen, and a third stage for the synthesis of urea from the ammonia and CO_2 with the production of H_2O, the improvement consisting essentially of condensing the H_2O, produced in said third stage as a second aqueous condensate, mixing said first and second aqueous condensates to form a combined aqueous condensate containing impurities including ammonia, urea, carbon dioxide, nitrogen, methanol, and hydrogen, passing said combined aqueous condensate through a filter adapted to remove solids therefrom, feeding said filtered combined aqueous condensate containing said impurities to a boiler so that steam is produced therefrom, and then utilizing said steam in the steam reforming in said first stage.

4,327,069

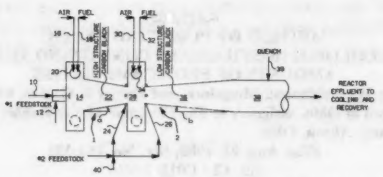
PROCESS FOR MAKING CARBON BLACK

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 25, 1980, Ser. No. 163,006

Int. Cl.³ C01B *31/02*; C09C *1/48*

U.S. Cl. 423—450 **7 Claims**



1. Process for producing carbon black of negative tint residual by pyrolytic decomposition of hydrocarbons in a carbon black furnace, comprising

(a) establishing a first flow of hot combustion gases formed by the combustion of a first fuel stream and a first oxygen containing stream,

(b) introducing a first stream of hydrocarbon feedstock into a first carbon black forming zone of said furnace and into admixture with said first flow of hot combustion gases to form a first carbon black forming mixture in which at least a portion of said first stream of hydrocarbon feedstock is converted to carbon black,

(c) passing said first carbon black forming mixture from said first carbon black forming zone under carbon black formation conditions into a second carbon black forming zone of said furnace which is in open connection and fluid communication with said first carbon black forming zone,

(d) establishing a second flow of hot combustion gases formed by the combustion of a second fuel stream and a second oxygen containing stream,

(e) introducing a second stream of hydrocarbon feedstock into a second carbon black forming zone of said furnace and into admixture with said second flow of hot combustion gases and into admixture with said first carbon black forming mixture such as to form a second black forming mixture in which at least a portion of said second stream of hydrocarbon feedstock is converted to carbon black,

(f) maintaining operation parameters in said first and said second carbon black forming zones such that in one of the carbon black forming zones, being a high structure zone, the hydrocarbon feedstock is converted into a high structure carbon black, and such that in the other carbon black forming zone, being a low structure zone, the hydrocarbon feedstock is converted into a low structure carbon black,

(g) passing said second carbon black forming mixture from said second carbon black forming zone into a quench zone,

(h) contacting said second carbon black forming mixture with a quench fluid to produce a carbon black containing smoke at a temperature below carbon black formation temperature,

(i) separating carbon black of negative tint residual from said smoke as the product of the process.

4,327,070

PRODUCTION OF POTASSIUM FORMATE FROM POTASSIUM SULFATE

Robert A. Meyers, Tarzana, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Aug. 8, 1980, Ser. No. 176,601

Int. Cl.³ H02K *44/00*; C07C *53/06*

U.S. Cl. 423—555 **4 Claims**

1. A method comprising contacting, in aqueous media at a pressure in the range of about 1.0 to about 3 atmospheres and at a temperature of not more than about 100° C., spent seed from an MHD reactor including potassium sulfate with calcium formate to form water-soluble potassium formate and water-insoluble calcium sulfate, separating said calcium sulfate, substantially free of potassium, from said aqueous media; and feeding the aqueous, water-soluble potassium formate to an MHD reactor as a potassium source.

4,327,071

METHOD OF PREPARING POTASSIUM HYDRIDE

Kuen-Wai Chiu, Mars, and John R. Strickler, Pittsburgh, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed May 7, 1981, Ser. No. 261,429

Int. Cl.³ C01B *6/04*

U.S. Cl. 423—646 **6 Claims**

1. A method of preparing potassium hydride and mixtures thereof with other alkali metal hydrides comprising contacting hydrogen and potassium or potassium alloys with other alkali metals dispersed in an inert liquid in the presence of a catalytically effective amount of potassium phenanthride.

4,327,072

TYROSYLATED PROINSULIN C-PEPTIDE DERIVATIVES

Ken Inouye, Kobe; Masao Kono, Ibaraki; Nobuo Yoshida, Nishinomiya; Masuhisa Nakamura, Toyonaka; Tadashi Okabayashi, Nishinomiya, and Ken'ichi Igano, Nara, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Nov. 27, 1979, Ser. No. 97,671

Int. Cl.³ G01N *33/56*; A61K *43/00*; C07C *103/52*

U.S. Cl. 424—1 **9 Claims**

1. A proinsulin C-peptide derivitive of the formula:

Y-Tyr-Gly-R

wherein Y represents a hydrogen atom or an amino protecting group, Tyr represents a tyrosine residue, wherein at least one of the hydrogen atoms on the phenyl ring may be substituted by a radioactive iodine, Gly represents a glycine residue, and R represents a peptide residue corresponding to an amino acid sequence which includes at least positions 7–21 of human proinsulin C-peptide.

4,327,073

AUTOMATED METHOD FOR QUANTITATIVE ANALYSIS OF BIOLOGICAL FLUIDS

Henry V. Huang, 232 S. Catalina, Pasadena, Calif. 91106

Filed Apr. 7, 1980, Ser. No. 138,182

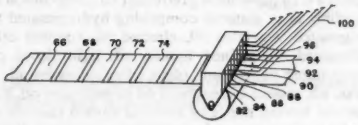
Int. Cl.³ G01N *33/54, 33/56, 33/58, 35/00*

U.S. Cl. 424—1 **17 Claims**

1. A method for quantitative analysis of a biological fluid for a plurality of substances, each of which forms specific reaction conjugates with a respective reactive compound which comprises the steps of:

(a) admixing said biological sample with a standard solution of tracer-labelled, known quantities of said substances;

(b) contacting the resultant mixture of biological sample and standard solution with a sensitized substrate carrier having a plurality of said respective reactive compounds bonded onto preselected areas of an inert substrate carrier forming a substrate carrier sensitized at each of a plurality of preselected areas with a respective one of a plurality of immobi-



lized reactive compounds interspaced by areas of said substrate carrier free of said compounds to permit said labeled and unlabeled substances contained in said mixture to competitively conjugate with their respective reactive compounds immobilized on said substrate carrier;

(c) washing excess of said sample from each of said preselected areas of said substrate carrier in a common washing treatment to obtain an exposed substrate carrier; and

(d) measuring the concentration of said conjugated substances on the preselected areas of said carrier.

4,327,074

METHOD FOR DIAGNOSIS AND SELECTIVE TREATMENT OF INFECTIONS OF BACTERIA HAVING β-GLUCURONIDASE ACTIVITY

David Rubin, 03, Jerusalem, all of Israel, and David Rubin, Jerusalem, Israel, assignors to Adolf W. Schwimmer, Savyon and Erwin S. Schwartz, Tel-Aviv

Continuation-in-part of Ser. No. 951,269, Oct. 13, 1978. This application Feb. 12, 1979, Ser. No. 11,619

Int. Cl.³ A61K *49/00, 43/00*

U.S. Cl. 424—1.5 **3 Claims**

1. A process for treating infections caused by bacteria having β-glucuronidase activity, comprising:

intravenously or orally administering to the patient an alkalinizing agent in an amount sufficient to maintain the pH of the internal tissues of the patient at a level of approximately 7.4; and

parenterally administering a glucuronide compound, the aglycone of which is toxic to bacterial cells, in an anti-bacteria effective amount,

whereby the β-glucuronidase activity of the bacterial cells causes deconjugation of the glucuronide at the site of the infection and release of the aglycone thereat.

4,327,075

SYNTHETIC ANTIGENICALLY-ACTIVE POLYPEPTIDE AND A PROCESS FOR ITS PREPARATION

Björn Lüning, Stockholm, Sweden, assignor to AB Bonnierföretagen, Stockholm, Sweden

Filed Apr. 14, 1980, Ser. No. 139,887

Claims priority, application Sweden, Apr. 20, 1979, 7903505

Int. Cl.³ A61K *39/00, 37/00*; C07C *103/52*; C01N *31/00*

U.S. Cl. 424—12 **8 Claims**

1. A synthetic antigenically active polypeptide, which includes the amino acid sequence: H-Asp-Ala-Glu-Gln-Arg-Gly-Glu-Leu-Ala-Ile-ARg-Asp-Ala-Asn-Ala-Arg-Leu-Ser-Glu-Leu-OH.

4,327,076

COMPRESSED CHEWABLE ANTACID TABLET AND METHOD FOR FORMING SAME

Wayne J. Puglia, Bellerose Village; Kanit J. Patanasinth, Tarrytown; Andrew T. Lombardo, Bronx, all of N.Y.; John E. Beam, Norwalk, Conn., and Donald A. M. Mackay, Pleasantville, N.Y., assignors to Life Savers, Inc., New York, N.Y.

Filed Nov. 17, 1980, Ser. No. 207,157

Int. Cl.³ A61K *9/20, 9/42, 33/08, 33/10*

U.S. Cl. 424—38 **5 Claims**

1. A compressed chewable antacid tablet having good hardness and flexibility and easy bite-through which comprises a blend of (a) a particulate pretreated fat composition comprising an edible fatty material comprising hydrogenated tallow, hydrogenated vegetable oil, almond oil, coconut oil, corn oil, cottonseed oil, refined linseed oil, light liquid petrolatum, heavy liquid petrolatum, olein, olive oil, palm oil, peanut oil, persic oil, sesame oil, soybean oil or safflower oil, a fat sorbing material having the fatty material sorbed thereon or therein, the fat sorbing material comprising microcrystalline cellulose, cornstarch, tapioca, dextrin, sucrose, sorbitol, xylitol or mannitol, and one or more tablet bonders said tablet bonders comprising tabletting sugar, dextrose monohydrate or mixtures thereof, blended therewith or mixtures thereof with one or more antioxidants, flavors, colorant or mixtures thereof; (b) a pretreated active ingredient composition comprised of a mixture of particles of active ingredient which comprises an antacid, or mixtures thereof with edible oil, binder, emulsifier, flavor, colorant or mixtures thereof; the particles of active ingredient being coated with the other components of said pretreated active ingredient composition; and (c) a pretreated direct compaction tabletting aids composition comprising one or more tablet bonders comprising tabletting sugar, dextrose monohydrate or mixtures thereof, or mixtures thereof with flavors.

4,327,077

COMPRESSED CHEWABLE ANTACID TABLET AND METHOD FOR FORMING SAME

Wayne J. Puglia, Bellerose Village; Kanit J. Patanasinth, Tarrytown; Andrew T. Lombardo, Bronx, and Walter Vink, Purdys Station, all of N.Y., assignors to Life Savers, Inc., New York, N.Y.

Filed May 29, 1981, Ser. No. 268,314

Int. Cl.³ A61K *9/20, 9/42, 33/08, 33/10*

U.S. Cl. 424—38 **12 Claims**

1. A compressed chewable antacid tablet having good breakage resistance and flexibility which comprises particles of a recrystallized fatty material comprising chocolate, synthetic chocolate or hydrogenated tallow, an antacid bound up in said particles of recrystallized fatty material, and a direct compaction vehicle which binds said particles of recrystallized fatty material and antacid, under compression, into a chewable tablet, said direct compaction vehicle comprising sorbitol, mannitol, dextrose monohydrate, anhydrous lactose, dicalcium phosphate dihydrate, co-crystallized sucrose with modified dextrins, cerelose or other corn syrup solids.

4,327,078

COSMETIC AGENTS INCLUDING SOLUBLE ELASTIN

Egbert Charlet, Rösrath, and Martin Kludas, Berlin, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 856,562, Dec. 1, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,773

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1976, 2656226; Oct. 7, 1977, 2745284

Int. Cl.³ A61K *7/00, 7/42, 7/48*

U.S. Cl. 424—45 **7 Claims**

1. A cosmetic agent containing as an active ingredient soluble elastin in which about 80% of said soluble elastin has a molecular weight in the range of from 3,000 to 10,000, about 10% of said soluble elastin has a molecular weight of about 10,000 to 25,000 and about 10% of said soluble elastin has a molecular weight in the range of 25,000 to 100,000, in an amount effective to combat skin withering for a visible cosmetic effect (1) in admixture with a solid or liquefied gaseous diluent or (2) in admixture with a liquid diluent.

4,327,079

DENTIFRICE COMPOSITIONS

Hideki Aoki, Funabashi, Japan, assignor to Dental Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1980, Ser. No. 201,727

Claims priority, application Japan, Nov. 15, 1979, 54/147011

Int. Cl.³ A61K *9/16*

U.S. Cl. 424—57 **1 Claim**

1. A dentifrice composition for tooth paste consisting essentially of: 30 to 35 parts by weight of an abrading agent containing 5 to 35 parts by weight of synthetic hydroxyapatite powder and the balance of at least one member selected from the group consisting of calcium phosphate and calcium pyrophosphate; 20 to 35 parts by weight of at least one filler selected from the group consisting of glycerin and sorbitol; 30 to 35 parts by weight of water; 0.27 to 3 parts by weight of at least one alkali metal chloride selected from the group consisting of NaCl and KCl; and, 0.01 to 0.3 parts by weight of $MgCl_2$.

4,327,080

NOVEL BENDROFLUMETHIAZIDE FORMULATIONS AND METHOD

Thomas M. Wong, North Brunswick, and Mahendra R. Patel, East Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 13, 1981, Ser. No. 282,359

Int. Cl.³ A61K *9/20, 31/79, 47/00*

U.S. Cl. 424—80 **24 Claims**

1. A solid substantially dry water-free bendroflumethiazide-containing formulation, having excellent disintegration and dissolution properties, comprising one or more excipients and a dry granulation including one or more fillers, and a preformed partial coprecipitate comprised of bendroflumethiazide, and a bendroflumethiazide wetting agent to convert said bendroflumethiazide into a more hydrophilic form, said preformed partial coprecipitate and filler being substantially homogeneously mixed with said one or more excipients.

4,327,081

METHOD OF ENHANCING ABSORPTION OF ANTITUMOR AGENT INTO GASTRO-INTESTINAL TUMOR SITE AND ORALLY ADMINISTRABLE ANTITUMOR COMPOSITIONS THEREFOR

Akira Matsuda, Omiya; Osamu Yoshioka, Yono; Katsutoshi Takahashi, Tokyo; Kooichi Yoshida, Soka, and Hiroshi Ninomiya, Sayama, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 894,844, Apr. 10, 1978, Pat. No. 4,273,761. This application Oct. 26, 1979, Ser. No. 88,527

Claims priority, application Japan, Apr. 12, 1977, 52-41687; Jul. 14, 1977, 52-83528

Int. Cl.³ A61K *31/78*

U.S. Cl. 424—81 **12 Claims**

1. A peroral antitumor composition containing an effective amount of bleomycin a sufficient amount of an alkali metal salt of polyacrylic acid having molecular weight 1,000,000 to 10,000,000 to enhance absorption of said active compound into the gastrointestinal tumor site, and a pharmaceutical adjuvant or adjuvants.

4,327,082

MASTITIS VACCINATION

Rodney E. Armitage, Northcliff, South Africa, assignor to Adcock-Ingram Laboratories Limited, Johannesburg, South Africa

Filed Aug. 14, 1980, Ser. No. 178,217
Claims priority, application South Africa, Jul. 12, 1979, 79/4883
Int. Cl.[3] A61K *39/085, 39/00*
U.S. Cl. 424—92 3 Claims

1. A method of vaccinating a cow against mastitis including the steps of administering to the cow an effective amount of an intravaginal anti-mastitis vaccine during the lactation period followed by administering an effective amount of an intracisternal anti-mastitis vaccine to the cow during the dry period, wherein the intravaginal and intracisternal vaccines contain Toxoided Alpha-Toxin, detoxified Leucocidin and an extract of the bacteria Staphylococcus aureus.

4,327,083

TREATMENT OF HYPERTENSION WITH BISULFITE

Jose A. A. Alvarez, Mexico City, Mexico, assignor to T & R Chemicals, Inc., Clint, Tex.

Continuation-in-part of Ser. No. 859,705, Dec. 12, 1977, abandoned. This application Sep. 14, 1979, Ser. No. 75,423
Int. Cl.[3] A31K *33/04*
U.S. Cl. 424—162 2 Claims

1. A process for achieving improvement in hypertension in a human suffering from said condition comprising orally introducing into said human sodium bisulfite as an aqueous solution at the rate of from about 0.2 to 2.0 mgm of sodium bisulfite per kilogram of body weight per 24 hours.

4,327,084

AQUEOUS SOLUTION FOR INTRAVENOUS ADMINISTRATION

Karl Groke, Eggersdorf, Austria, assignor to Chemie Linz Aktiengesellschaft, Linz, Austria

Continuation-in-part of Ser. No. 892,863, Mar. 31, 1978, abandoned. This application Oct. 26, 1979, Ser. No. 88,651
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1977, 2731013
Int. Cl.[3] A61K *31/00, 47/00, 31/625, 31/505*
U.S. Cl. 424—176 3 Claims

1. A pharmaceutical composition comprising a clear, aqueous solution capable for infusion by intravenous administration, said solution comprising from about 0.1 to about 1% w/v of 3-methoxy-4-(4'-aminobenzol-sulphonamido)-1,2,5-thiadiazole as a medicinally-acceptable basic water-soluble salt, from about 0.02 to about 0.15% w/v of 2,4-diamino-5-(3',4',5'-trimethoxybenzyl)-pyrimidine, from about 5 to about 20% w/v of a sugar compound selected from the group consisting of sorbitol, xylitol, mannitol, glucose, fructose and a mixture of glucose and fructose, and water, said solution having a pH value within the range of 6 to 8, with the proviso that said composition does not contain any organic solvent.

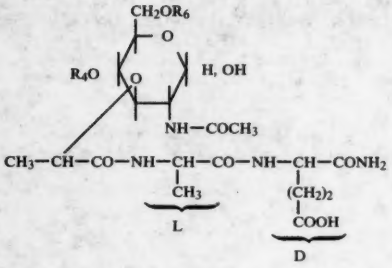
4,327,085

BIOLOGICALLY ACTIVE COMPOSITIONS AND METHODS OF USE

Francoise Audibert, Neuilly-sur-Seine, and Pierre Lefrancier, Bures-sur-Yvette, both of France, assignors to Agencie National de Valorisation de la Recherache (ANVAR), Neuilly sur Seine, France

Continuation of Ser. No. 914,074, Jun. 9, 1978. This application Mar. 31, 1980, Ser. No. 135,935
Claims priority, application France, Oct. 23, 1973, 73 37806; Jul. 1, 1974, 74 22909
Int. Cl.[3] A61K *37/00*
U.S. Cl. 424—177 23 Claims

1. The compound of the general formula



wherein R_4 is selected from the group consisting of hydrogen, acetyl and succinyl and R_6 is succinyl.

4,327,086

PROCESS FOR HEAT TREATMENT OF AQUEOUS SOLUTION CONTAINING HUMAN BLOOD COAGULATION FACTOR XIII

Tsunekazu Fukushima, Kobe; Tomiyuki Matsunaga, Hirakata, and Satoshi Funakoshi, Katano, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Mar. 20, 1981, Ser. No. 245,971
Claims priority, application Japan, Mar. 27, 1980, 55-40050
Int. Cl.[3] A61K *37/00, 35/14, 35/48*
U.S. Cl. 424—177 9 Claims

1. A process for heat treatment to inactive hepatitis virus in human blood coagulation factor XIII compositions, which comprises carrying out the heat treatment at 50° to 80° C. of an aqueous solution containing the human blood coagulation factor XIII for 3 to 15 hours in the presence of 10% (W/V) or more of at least one principal stabilizer selected from the group consisting of neutral amino acids, monosaccharides and sugar alcohols and 10% (W/V) or more of at least one auxiliary stabilizer selected from the group consisting of salts of organic hydrocarbon and hydroxyhydrocarbon carboxylic acids having 3 to 10 carbon atoms.

4,327,087

STABILIZED NETILMICIN FORMULATIONS

Bernard E. Rosenkrantz, Bloomfield, and Elliot Stupak, West Caldwell, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 869,741, Jan. 16, 1978, Pat. No. 4,223,022. This application Apr. 17, 1980, Ser. No. 141,029
Int. Cl.[3] A61K *31/71;* C07H *15/22*
U.S. Cl. 424—180 6 Claims

1. A pharmaceutical product comprising a sealed parenteral package, and a pH-and color-stabilized sterile aqueous antibiotic solution suitable for parenteral use consisting essentially of a parenterally acceptable salt of netilmicin, said solution having a pH in the range of 5.0–7.0, said composition being within said package.

4,327,088

PHOSPHONOOXY- OR GLYCOSYLOXY-SUBSTITUTED ACRYLOPHENONES, COMPOSITIONS AND USES THEREOF

Nobuo Shinma, Clifton, N.J.; Isao Umeda, Yokohama, Japan; Hideo Ishitsuka, Yokohama, Japan, and Yasuji Suhara, Yokohama, Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

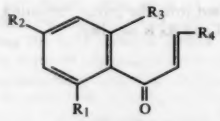
Filed May 12, 1980, Ser. No. 148,616

Claims priority, application United Kingdom, May 23, 1979, 17973/79

Int. Cl.[3] A61K *31/66, 31/72;* C07F *9/38;* C07H *15/20*

U.S. Cl. 424—180 52 Claims

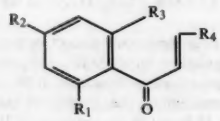
1. A compound of the formula:



I

wherein R_1 is phosphonooxy, aminoglycosyloxy or acylaminoglycosyloxy; R_2 and R_3 each are lower alkoxy; and R_4 is benzimidazolyl, furyl which is unsubstituted or substituted with lower alkyl, thienyl which is unsubstituted or substituted with lower alkyl, or phenyl which is substituted with lower alkyl, lower alkoxy, methylthio, methylenedioxy, acetoxy or methoxymethoxy, or pharmaceutically acceptable salts thereof.

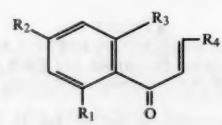
48. A method for treating a mammal infected by an enterovirus comprising administering to said mammal a compound of the formula:



I

wherein R_1 is phosphonooxy, aminoglycosyloxy or acylaminoglycosyloxy; R_2 and R_3 each are lower alkoxy; and R_4 is benzimidazolyl, furyl which is unsubstituted or substituted with lower alkyl, thienyl which is unsubstituted or substituted with lower alkyl, or phenyl which is substituted with lower alkyl, lower alkoxy, methylthio, methylenedioxy, acetoxy or methoxymethoxy, or pharmaceutically acceptable salts thereof in an amount which is effective as an anti-enteroviral agent.

49. A method for treating a mammal infected by a rhinovirus comprising administering to said mammal a compound of the formula:



I

wherein R_1 is phosphonooxy, aminoglycosyloxy or acylaminoglycosyloxy; R_2 and R_3 each are lower alkoxy; and R_4 is benzimidazolyl, furyl which is unsubstituted or substituted with lower alkyl, thienyl which is unsubstituted or substituted with lower alkyl or phenyl which is substituted with lower alkyl, lower alkoxy, methylthio, methylenedioxy, acetoxy or methoxymethoxy, or pharmaceutically acceptable salts thereof in an amount which is effective as an anti-rhinoviral agent.

4,327,089

O-(N-ALKOXY-PYRIDINECARBOXIMIDOYL) PHOSPHATES, PROCESS FOR PRODUCING THE SAME, AND INSECTICIDAL OR ACARIDICAL COMPOSITIONS CONTAINING THE SAME

Takahiro Haga, Kusatsu; Tadaaki Toki; Toru Koyanagi, both of Moriyama, and Osamu Imai, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

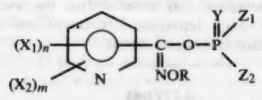
Filed Dec. 12, 1980, Ser. No. 215,777

Claims priority, application Japan, Dec. 12, 1979, 54-160268

Int. Cl.[3] A01N *57/16;* G07F *9/58*

U.S. Cl. 424—200 19 Claims

1. An O-(N-alkoxy-pyridinecarboximidoyl)phosphate represented by the following formula (I):



(I)

wherein X_1 is a halogen atom; X_2 is a lower alkyl group having 1 to 2 carbon atoms, an acetyloxy group, a trifluoromethyl group or a nitro group; Y is an oxygen atom or a sulfur atom; R is a lower alkyl group having 1 to 3 carbon atoms; n is an integer of 0 to 3; m is an integer of 0 to 1; and Z_1 and Z_2 are each a lower alkoxy group having 1 to 3 carbon atoms, a lower alkylthio group having 1 to 3 carbon atoms, a phenyl group which may be substituted with a lower alkyl group having 1 to 4 carbon atoms, a phenoxy group, a haloalkoxy group or a lower alkylamino group having 1 to 4 carbon atoms.

11. An insecticidal or acaricidal composition comprising an insecticidally or acaricidally effective amount of an O-(N-alkoxy-pyridinecarboximidoyl)phosphate having the formula (I) according to claim 1 as an active ingredient and an agriculturally acceptable adjuvant.

4,327,090

OXIMINOPHOSPHORIC ACID DERIVATIVES, THEIR PREPARATION AND THEIR USE IN PEST CONTROL

Rainer Buerstinghaus, Weinheim-Luetzelsachsen; Karl Kiehs, Lampertheim; Hardo Siegel, Speyer, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

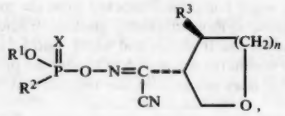
Filed Dec. 8, 1980, Ser. No. 213,790

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1979, 2952738

Int. Cl.[3] A61K *31/665;* C07D *306/09, 307/06*

U.S. Cl. 424—203 5 Claims

1. An oximinophosphoric acid derivative of the formula



(I)

where

R^1 is unbranched or branched alkyl of up to 4 carbon atoms,

R^2 is unbranched or branched alkoxy or alkylthio of up to 4 carbon atoms, unbranched or branched alkyl of up to 3 carbon atoms, phenyl, amino, alkylamino or dialkylamino, where each alkyl is unbranched or branched and of up to 4 carbon atoms,

R^3 is hydrogen or methyl,

X is oxygen or sulfur and

n is 1 or 2.

4. A pesticide comprising solid and/or liquid additives and a pesticidally effective amount of an oximinophosphoric acid derivative of the formula I as claimed in claim 1.

4,327,091

N,N-DI AND N,N,N-TRI(HYDROXY-LOWER ALKYL) AMMONIUM SALTS OF SUBSTITUTED 3,4-DIHYDRO-2H-1,2-BENZOTHIAZINE 1,1 DIOXIDE AND PHARMACEUTICAL COMPOSITIONS THEREOF

Alex Sele, Muttenz; Pier G. Ferrini; Georges Haas, both of Binningen; Knut A. Jaeggi, Basel, and Alberto Rossi, Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 4,113, Jan. 17, 1979, Pat. No. 4,213,980. This application Jan. 28, 1980, Ser. No. 116,200

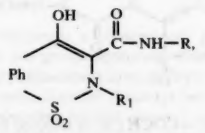
Claims priority, application Switzerland, Jan. 30, 1978, 993/78

The portion of the term of this patent subsequent to Jul. 22, 1997, has been disclaimed.

Int. Cl.[3] A61K *31/54;* C07D *417/12*

U.S. Cl. 424—246 10 Claims

1. A substituted 3,4-dihydro-2H-1,2-benzothiazine 1,1-dioxide of the formula



(I)

wherein Ph represents 1,2-phenylene or 1,2-phenylene substituted by lower alkyl, lower alkoxy, lower alkanoyl, halogen trifluoromethyl or nitro, R represents benzopyrone or benzopyrone substituted by lower alkyl, lower alkoxy, halogen, hydroxy, lower alkanoyloxy, optionally lower-alkylated or lower alkanoylated amino, trifluoromethyl or, at two adjacent carbon atoms, by lower alkylene or lower alkylenedioxy, and R_1 represents hydrogen, lower alkyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl, lower alkenyl, phenyl-lower alkyl or phenyl-lower alkyl substituted by lower alkyl, alkoxy, halogen, trifluoromethyl or nitro, in the form of a N,N-di(hydroxy-lower alkyl)-or N,N,N-tri(hydroxy-lower alkyl)-ammonium salt.

10. A pharmaceutical preparation containing an anti-inflammatorically effective amount of a compound as claimed in claim 1, together with conventional adjuvants and/or carriers.

4,327,092

AMINOCYCLOPENTANE ALKENOIC ACIDS AND ESTERS AND PHARMACEUTICAL FORMULATIONS

Eric W. Collington, Welwyn; Peter Hallett, Buntingford, and Christopher J. Wallis, Royston, all of England, assignors to Glaxo Group Limited, England

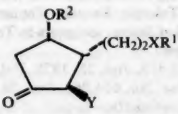
Filed Apr. 29, 1981, Ser. No. 258,737

Claims priority, application United Kingdom, Jan. 7, 1981, 00326/81

Int. Cl.[3] C07D *413/12;* A61K *31/535, 31/54;* C07D *417/12*

U.S. Cl. 424—246 8 Claims

1. Compounds of the general formula (1)



(1)

wherein

X is cis or trans —CH=CH—;

R^1 is straight or branched C_{1-7} alkyl bearing as a terminal substituent —$COOR^3$ where R^3 is a hydrogen atom, C_{1-6} alkyl or C_{7-10} aralkyl;

Y represents a saturated heterocyclic amino group which has 5 to 8 ring members and (a) optionally contains in the ring —O—, —S—, —SO_2—, —NR^4 (where R^4 is a hydrogen atom, C_{1-7} alkyl or aralkyl having a C_{1-4} alkyl portion; and/or (b) is optionally substituted by one or more C_{1-4} alkyl groups;

R^2 is C_{1-5} alkyl substituted by thienyl or furanyl (the thienyl and furanyl groups being optionally substituted by C_{1-6} alkyl, C_{1-6} alkoxy, aryl or phenyl (C_{1-3}) alkyl or phenyl (C_{1-3})-alkoxy (the aryl or phenyl group in each case being optionally substituted by C_{1-3} alkyl, C_{1-3} alkoxy or halogen), aryloxy, C_{5-7} cycloalkyl, halogen, nitro or thienyl);

and the physiologically acceptable salts and the solvates thereof.

8. A pharmaceutical composition comprising an effective amount of a compound as claimed in claim 1 together with one or more pharmaceutical carriers.

4,327,093

3,7-DISUBSTITUTED-2 OR 3-CEPHEM-4-CARBOXYLIC ACID COMPOUNDS

Ikuo Ueda, Toyonaka; Masakazu Kobayashi; Hisashi Yamada, both of Ikeda, and Hiroki Ono, Nagaokakyo, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

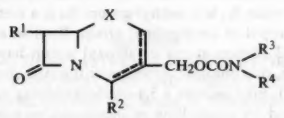
Filed Oct. 17, 1979, Ser. No. 85,684

Claims priority, application United Kingdom, Oct. 24, 1978, 41754/78

Int. Cl.[3] C07D *501/38*

U.S. Cl. 424—246 9 Claims

1. 3,7-Disubstituted-2 or 3-cephem-4-carboxylic acid compounds of the formula:



wherein R^1 is acylamino or ar(lower)alkylamino; R^2 is carboxy or carboxy protected by a pharmaceutically acceptable group; —N—R^3, R^4 is di(lower)alkylamino(lower)alkylamino, an unsaturated or saturated 3 to 8 membered heteromonocyclic (lower)alkylamino group containing 1 to 4 nitrogen atoms, an unsaturated or saturated 3 to 8 membered heteromonocyclic (lower)alkylamino group containing 1 to 4 nitrogen atoms substituted by lower alkyl or hydroxy(lower) alkyl, an unsaturated or saturated 5 to 6 membered heteromonocyclic group containing 2 to 4 nitrogen atoms, an unsaturated or saturated 5 to 6 membered heteromonocyclic group containing 2 to 4 nitrogen atoms substituted by lower alkyl or hydroxy(lower-)alkyl or hydroxypiperidino, and X is —S— or

and pharmaceutically acceptable salts thereof.

4,327,094

INSECTICIDAL AND ACARICIDAL 3,5-DIOXO-2,3,4,5-TRIAZINE COMPOUNDS

Masato Mizutani, Kyoto; Kazunori Tsushima, Nishinomiya; Yuzuru Sanemitsu, Ashiya, and Masachika Hirano, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

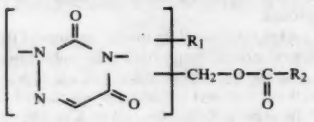
Filed Jan. 16, 1981, Ser. No. 225,749

Claims priority, application Japan, Jan. 29, 1980, 55-9544; Apr. 28, 1980, 55-56455

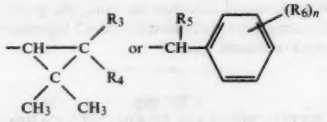
Int. Cl.[3] C07D *253/06;* A01N *43/64*

U.S. Cl. 424—249 6 Claims

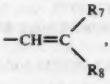
1. A carboxylate of the formula,



wherein R_1 is an allyl or propargyl group, R_2 is a group of



in which R_3 is a hydrogen atom or a methyl group, and when R_3 is a hydrogen atom, R_4 is a group of



(in which R_7 is a chlorine, bromine or fluorine atom, or a methyl, vinyl, methoxycarbonyl or methoxymethyl group, R_8 is a hydrogen, chlorine, bromine or fluorine atom or a methyl group), and when R_3 is a methyl group, R_4 is a methyl group, R_5 is an isopropyl or cyclopropyl group, R_6 is an alkyl group having 1 to 3 carbon atoms or alkoxyl group having 1 to 3 carbon atoms, or a chlorine, bromine or fluorine atom, n is 1 to 2, and $-(R_6)_n$ may include a 3,4-methylenedioxy group.

6. A method for controlling an insect and/or acarid, which comprises applying an insecticidally and/or acaricidally effective amount of the compound according to claim **1** to the insect and/or acarid.

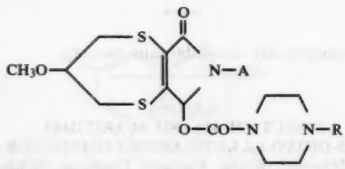
4,327,095

METHOXY DERIVATIVES OF 1,4-DITHIEPINO-[2,3-C]-PYRROLE

Daniel Farge, Thiais; Andre Leger, Paris, and Gerard Ponsinet, Sucy-En-Brie, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Mar. 13, 1980, Ser. No. 130,132
Claims priority, application France, Mar. 15, 1979, 79 06562
Int. Cl.³ A61K *31/385*; C07D *513/04*
U.S. Cl. 424—250 **13 Claims**

1. A 1,4-dithiepino[2,3-c]pyrrole compound of the formula:



wherein A represents pyrid-2-yl, quinol-2-yl or 1,8-naphthyridin-2-yl, or pyrid-2-yl, quinol-2-yl or 1,8-naphthyridin-2-yl substituted by one halogen, alkyl of 1 through 4 carbon atoms or alkoxy of 1 through 4 carbon atoms, and R represents hydrogen, alkyl of 1 through 4 carbon atoms or alkanoyl of 1 through 4 carbon atoms, and when R is hydrogen or alkyl non-toxic pharmaceutically acceptable acid addition salts thereof.

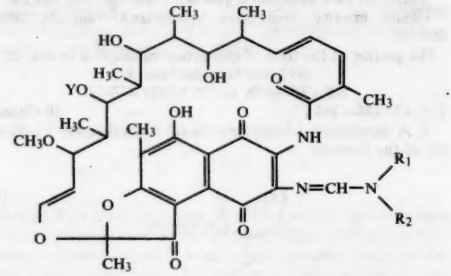
4,327,096

3-AMIDINO ANSAMYCINS

Leonardo Marsili; Giovanni Franceschi, and Aurora Sanfilippo, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Feb. 9, 1981, Ser. No. 232,533
Int. Cl.³ A61K *31/395*; C07D *498/08*
U.S. Cl. 424—250 **12 Claims**

1. A 3-amidino rifamycin having the formula



Wherein: Y is —H or —$COCH_3$; R_1 is selected from the group consisting of linear or branched alkyl having from 1 to 7 carbon atoms, and alkenyl having 3 or 4 carbon atoms; R_2 is selected from the group consisting of linear or branched alkyl having from 1 to 7 carbon atoms, chloroalkyl having from 2 to 4 carbon atoms, alkenyl having 3 or 4 carbon atoms, cycloalkyl having from 3 to 7 carbon atoms in the ring, cycloalkylalkyl having from 3 to 6 carbon atoms in the ring, phenyl, bornyl, unsubstituted arylalkyl hydrocarbon having 7 or 8 carbon atoms, arylalkyl hydrocarbon having 7 or 8 carbon atoms and substituted with one halogen atom in the aryl group; and R_1 and R_2 along with the N atom to which they are bonded form a cyclic moiety, said moiety being pyrrolidinyl, piperidinyl, hexahydroazepinyl, or heptahydroazocinyl, each of which may be unsubstituted or substituted with 1 or 2 methyl radicals, 4-alkylpiperazinyl, morpholinyl, or 1,2,3,4-tetrahydroisoquinolinyl.

11. An antibacterial composition which comprises a rifamycin compound as claimed in claims **1** and **2**, and effective amount of an antibacterial acceptable carrier or diluent therefor.

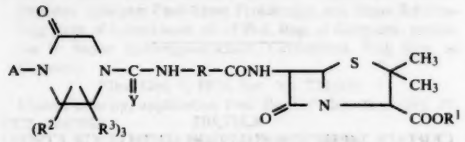
4,327,097

NOVEL PENICILLINS

Isamu Saikawa; Shuntaro Takano, both of Toyama; Chosaku Yoshida, Takaoka; Okuta Takashima, Toyama; Kaishu Momonoi, Shinminato; Seietsu Kuroda, Toyama; Miwako Komatsu, Toyama; Takashi Yasuda, Toyama, and Yutaka Kodama, Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 915,873, Jun. 15, 1978, Pat. No. 4,219,554, which is a division of Ser. No. 654,060, Jan. 30, 1976, Pat. No. 4,112,090, which is a continuation-in-part of Ser. No. 571,479, Apr. 24, 1975, Pat. No. 4,087,424. This application Jun. 12, 1979, Ser. No. 47,818
Claims priority, application Japan, May 9, 1974, 49-50663; May 13, 1974, 49-52254; May 31, 1974, 49-60787; Aug. 13, 1974, 49-91996; Sep. 26, 1974, 49-109954; Dec. 13, 1974, 49-142499; Mar. 27, 1975, 50-37207
Int. Cl.³ A61K *31/495*; C07D *499/70*
U.S. Cl. 424—250 **14 Claims**

1. An antibacterial compound of the formula (1),



wherein R is a group represented by the formula,

wherein R^5 represents a conventional penicillin substituent selected from the group consisting of alkyl, cycloalkyl, cycloalkenyl, cycloalkadienyl, aryl, aralkyl, aryloxy, alkylthioalkyl, furyl, thienyl, oxazolyl, thiazolyl, isoxazolyl, isothiazolyl, imidazolyl, pyrazolyl, pyridyl, pyrazyl, pyrimidyl, pyridazyl, quinolyl, isoquinolyl, quinazolyl, indolyl, indazolyl, 1,3,4-oxadiazolyl, 1,2,4-oxadiazolyl, 1,3,4-thiadiazolyl and 1,2,4-thiadiazolyl, each of which may be substituted by halogen, hydroxy, nitro, alkyl, alkoxy, alkylthio, acyl or alkylsulfonylamino; R^6 represents a hydrogen atom; and R^5 and R^6 together with a common carbon atom may form a conventional penicillin substituent selected from the group consisting of cycloalkyl, cycloalkenyl and cycloalkadienyl ring;

R^1 represents a hydrogen atom, a conventional penicillin blocking group of a conventional penicillin or a conventional salt-forming cation of a conventional penicillin; each pair of R^2 and R^3 are linked to the same carbon atom, and each R^2 and R^3 of the three pairs of R^2 and R^3, which may be the same or different, represent individually a conventional penicillin substituent selected from the group consisting of hydrogen, halogen, carboxyl, alkyl, cycloalkyl, aryl, acyl, aralkyl, alkoxycarbonylalkyl, acyloxyalkyl, alkoxy, alkoxycarbonyl, cycloalkyloxycarbonyl, aralkoxycarbonyl, aryloxycarbonyl, amino and carbamoyl; any of which may be substituted by halogen, alkyl, alkoxy, alkylthio, acyl or nitro; and any pair of R^2 and R^3 together with a common carbon atom may form a conventional penicillin substituent which is a cycloalkyl ring;

A represents a conventional penicillin substituent selected from the group consisting of halogen, hydroxy, nitro, cyano, alkyl, alkenyl, alkadienyl, cycloalkyl, cycloalkenyl, cycloalkadienyl, aryl, acyl, aralkyl, acyloxyalkyl, alkoxy, cycloalkyloxy, alkoxycarbonyl, aryloxy, cycloalkyloxycarbonyl, aryloxycarbonyl, aralkoxycarbonyl, alkylsulfonyl, cycloalkylsulfonyl, arylsulfonyl, carbamoyl, thiocarbamoyl, acylcarbamoyl, acylthiocarbamoyl, alkylsulfonylcarbamoyl, arylsulfonylcarbamoyl, alkylsulfonylthiocarbamoyl, arylsulfonylthiocarbamoyl, sulfamoyl, alkoxycarbonylthioalkyl, alkoxythiocarbonylthioalkyl, amino, thiazolyl, pyridyl, pyridazyl, pyrazyl, thiadiazolyl, thiazolyl, tetrazolyl and quinolyl, each of which may be substituted by a conventional penicillin substitutent selected from the group consisting of halogen, hydroxyl, alkyl, alkoxy, alkylthio, nitro, cyano, amino, carboxyl, and acyl; and

Y represents an oxygen or sulfur atom.

5. An antibacterial pharmaceutical composition comprising an antibacterially effective amount of a compound of claim **1** and a pharmaceutically acceptable carrier.

4,327,098

PHARMACEUTICAL COMPOSITIONS USEFUL IN THE TREATMENT OF CARDIOVASCULAR HYPERTENSION AND CONTAINING 4-SUBSTITUTED-2-IMINOIMADAZOLIDINE COMPOUNDS

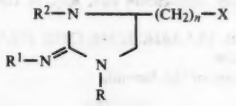
Albert D. Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Division of Ser. No. 9,899, Feb. 6, 1979, Pat. No. 4,247,705. This application May 5, 1980, Ser. No. 146,610

Int. Cl.[3] **A61K** *31/495, 31/445, 31/415*

U.S. Cl. 424—250 **10 Claims**

1. A method for the treatment of cardiovascular hypertension in a patient comprising administering a pharmaceutical carrier and a hypertension inhibiting quantity of a 2-iminoimidazolidine compound corresponding to the formula:



wherein R is loweralkyl; R^1 is a member selected from hydrogen, loweralkyl, phenyl, loweralkylphenyl, and chlorophenyl; R^2 is a member selected from loweralkyl, phenyl, loweralkylphenyl, and chlorophenyl; X is a member selected from amino, diloweralkylamino, di(phenylloweralkyl)amino, 1-piperidino, 1-piperazino, 1-morpholino, and choro; and n is the integer 1 or 2, or a pharmaceutically acceptable acid addition salt thereof.

4,327,099

PYRANO DERIVATIVES, A PROCESS FOR THEIR PREPARATION AND THEIR USE

John M. Evans, Roydon, and Roger E. Markwell, Great Dunmow, both of England, assignors to Beecham Group Limited, England

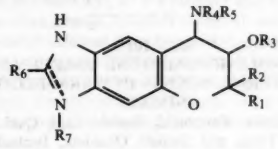
Filed Jan. 28, 1981, Ser. No. 229,190

Claims priority, application United Kingdom, Feb. 2, 1980, 3595/80

Int. Cl.[3] **A61K** *31/435, 31/415;* **C07D** *487/00, 235/02*

U.S. Cl. 424—256 **10 Claims**

1. A compound of the formula (I):



(I)

wherein

R_1 and R_2 are independently selected from a hydrogen atom and a C_{1-3} alkyl group;

R_3 is a hydrogen atom, a C_{1-3} alkyl or C_{2-4} acyl group;

R_4 is a hydrogen atom or C_{1-5} alkyl group;

R_5 is a C_{1-5} alkyl group, a straight chain C_{1-3} alkyl group terminally substituted by a chlorine atom;

or

R_4 and R_5 are joined so that together with the nitrogen atom to which they are attached they form pyrrolidyl or piperidinyl;

R_6 is a hydrogen atom, or a C_{1-5} alkyl, phenyl, CF_3 or XH group wherein X is an oxygen or sulphur atom, the dotted line represents a bond, and R_7 is not present; or R_6 is an oxygen atom joined to the ring carbon atom by a double bond, the dotted line is not present, and R_7 is hydrogen;

the NR_4R_5 and OR_3 moieties are trans; and pharmaceutically acceptable salts thereof.

9. A pharmaceutical composition for treating hypertension,

comprising an anti-hypertensive effective amount of a compound according to claim 1 and a pharmaceutically acceptable carrier.

10. A method for the treatment of hypertension in mammals including man, comprising administering to the sufferer an anti-hypertensive effective amount of a compound according to claim 1.

4,327,100

2-(ALKOXY-PHENYL)-IMIDAZO(4,5-B)PYRIDINES AND SALTS THEREOF

Volkhard Austel; Manfred Reiffen, both of Biberach; Joachim Heider, Warthausen, and Willi Diederen, Biberach, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

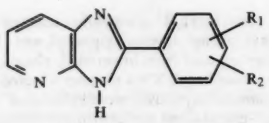
Filed Jun. 30, 1980, Ser. No. 163,970

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2927987

Int. Cl.³ A61K *31/44*; C07D *471/04*

U.S. Cl. 424—256 **9 Claims**

1. A compound of the formula



wherein

R_1 is alkoxy of 1 to 3 carbon atoms; and

R_2 is (aralkylsulfinyl of 7 to 9 carbon atoms)-(alkoxy of 2 to 3 carbon atoms); or (unsubstituted, mono-, di- or trisubstituted phenylsulfinyl)-(alkoxy of 2 to 3 carbon atoms), where the substituents are attached to the phenyl moiety and are nitro, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms or halogen;

a 3H-tautomer thereof; or a non-toxic, pharmacologically acceptable acid addition salt thereof.

9. The method of raising the blood pressure or increasing the strength of heart muscle contraction in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective hypertensive or positively inotropic amount of a compound of claim 1.

4,327,101

QUINOLINE COMPOUND USEFUL AS ANTIBACTERIAL AGENTS IN WARM-BLOODED ANIMALS

Yoshitaka Mushika, Kawanishi; Junichi Tani, Osaka; Totaro Yamaguchi, Yono, and Satoshi Ohshima, Iwatsuki, all of Japan, assignors to Tanabe Seikaku Co., Ltd., Osaka, Japan

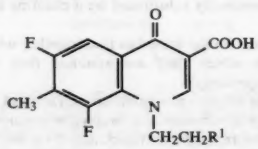
Filed Sep. 19, 1980, Ser. No. 188,713

Claims priority, application Japan, Oct. 5, 1979, 54-129120

Int. Cl.³ A61K *31/47*; C07D *215/56*

U.S. Cl. 424—258 **5 Claims**

1. A quinoline compound of the formula:



(I)

wherein R^1 is hydrogen or fluorine, or a pharmaceutically acceptable salt thereof.

4. An anti bacterial composition comprising an amount of the compound of claim 1 which, when administered to a warm blooded animal, provides an effective amount of said compound, and a pharmaceutically acceptable carrier.

4,327,102

CERTAIN 2-(PHENYL SULFINYLMETHYL OR ETHYL) PYRIDINE DERIVATIVES, COMPOSITION CONTAINING SAME AND METHOD OF USING SAME

Roger Crossley, Reading, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

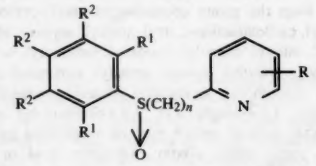
Filed Feb. 9, 1981, Ser. No. 232,452

Claims priority, application United Kingdom, Feb. 20, 1980, 5668/80; Feb. 20, 1980, 5669/80

Int. Cl.³ C07D *213/34*; A61K *31/44*

U.S. Cl. 424—263 **10 Claims**

1. A compound of formula I



wherein R represents hydrogen or lower alkyl, R^1 represents hydrogen or fluorine, R^2 represents hydrogen, fluorine, chlorine or trifluoromethyl, n is 1 or 2 or a pharmaceutically acceptable acid addition salt thereof.

10. A method of treating ulcers or hypersecretion in a mammal, which method comprises orally administering to said mammal in need of such treatment an effective amount of a compound as claimed in claim 1.

4,327,103

3-{3-[4-(4-FLUOROBENZOYL)PIPERIDYL]PROPYL}-2-METHYL INDOLE

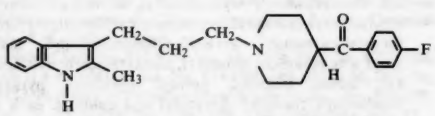
Grover C. Helsley, Pottersville; Joseph T. Strupczewski, Flemington, both of N.J., and Beth A. Gardner, San Jose, Calif., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

Filed Jul. 7, 1980, Ser. No. 166,419

Int. Cl.³ A61K *31/445*; C07D *403/06, 401/06*

U.S. Cl. 424—267 **4 Claims**

1. A compound of the formula



or an acid addition salt thereof prepared from a pharmaceutically acceptable acid.

2. A method of depressing the central nervous system which comprises administering to a patient a pharmaceutically effective amount of 3-{3-[4-(4-fluorobenzoyl)piperidyl]-propyl} -2-methyl indole or an acid addition salt thereof prepared from a pharmaceutically acceptable acid.

4,327,104

1-PHENYL-2-(1,2,4-TRIAZOLYL-1-YL)-ETHYL ETHER

Helmut Timmler; Karl Büchel, both of Wuppertal; Wilhelm Brandes, Cologne; Paul-Ernst Frohberger, and Hans Scheinpflug, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

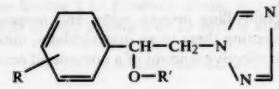
Filed Oct. 6, 1976, Ser. No. 729,935

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1975, 2547953

Int. Cl.[3] A01N *43/64;* C07D *249/08*

U.S. Cl. 424—269 8 Claims

1. A 1-phenyl-2-(1,2,4-triazol-1-yl)-ethyl ether of the formula



in which

R is 2,4-diCl, phenyl, phenoxy, or phenyl or phenoxy carrying at least one substituent selected from halogen, cyano, nitro and halogenoalkyl with 1 or 2 carbon atoms and up to 3 identical or different halogen atoms,

R′ is alkenyl or alkynyl with up to 4 carbon atoms,

or a salt thereof with a physiologically tolerated acid.

6. A fungicidal or bactericidal composition containing as active ingredient a fungicidally or bactericidally effective amount of a compound according to claim 1 or a salt thereof with a physiologically tolerated acid in admixture with a diluent.

4,327,105

AMINO-PENICILLIN DERIVATIVE, AND THERAPEUTIC COMPOSITION CONTAINING THE SAME

Juan B. A. Scalesciani, Calle Y.B. Alberdi, Buenos Aires, Argentina

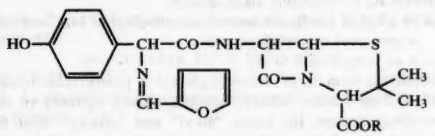
Filed Mar. 9, 1981, Ser. No. 241,641

Claims priority, application Italy, Dec. 2, 1980, 26351 A/80

Int. Cl.[3] A61K *31/43;* C07D *499/70*

U.S. Cl. 424—271 2 Claims

2. A therapeutic composition comprising an antibacterially effective amount of a compound of the formula:



in which R=H, Na or K, and a therapeutically acceptable carrier.

4,327,106

2-(PHENYL-AMINO)-2-IMIDAZOLINES AND SALTS

Helmut Stähle; Herbert Köppe; Werner Kummer, all of Ingelheim am Rhein, Fed. Rep. of Germany, and Christian Lillie, Vienna, Austria, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

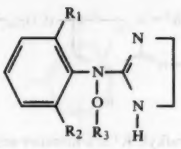
Filed Dec. 10, 1980, Ser. No. 215,105

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1979, 2950345

Int. Cl.[3] A61K *31/415;* C07D *231/06*

U.S. Cl. 424—273 R 8 Claims

1. A compound of the formula



wherein

R_1 and R_2 are each fluorine, chlorine, bromine or trifluoromethyl, and

R_3 is alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, cyclopropylmethyl, benzyl or thienyl-2-methyl,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,327,107

METHOD USEFUL IN THE TREATMENT OF SUGAR CATARACTS USING 4-SUBSTITUTED-2-IMINOIMIDAZOLIDINE COMPOUNDS

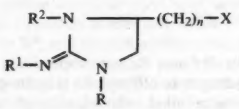
Albert D. Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Division of Ser. No. 9,899, Feb. 6, 1979, Pat. No. 4,247,705. This application May 5, 1980, Ser. No. 146,608

Int. Cl.[3] A61K *31/415, 31/495, 31/445*

U.S. Cl. 424—273 R 7 Claims

1. A method for the treatment of sugar cataracts in a patient comprising administering a pharmaceutical carrier and a sugar cataract formation inhibiting quantity of a 2-iminoimidazolidine compound corresponding to the formula:



wherein R is loweralkyl; R^1 is a member selected from hydrogen, loweralkyl, phenyl, loweralkyl phenyl, and chlorophenyl; R^2 is a member selected from loweralkyl, phenyl, loweralkylphenyl, and chlorophenyl; X is a member selected from amino, diloweralkylamino, di(phenylloweralkyl)amino, 1-piperidino, 1-piperazino, 1-morpholino, and chloro; and n is the integer 1 or 2, or a pharmaceutically acceptable acid addition salt thereof.

4,327,108

METHODS USEFUL IN THE TREATMENT OF CARDIAC ARRHYTHMIA USING 4-SUBSTITUTED-2-IMINOIMIDAZOLIDINE COMPOUNDS

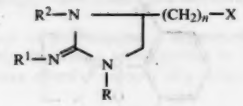
Albert D. Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Division of Ser. No. 9,899, Feb. 5, 1979, Pat. No. 4,247,705. This application May 5, 1980, Ser. No. 146,612

Int. Cl.[3] A61K *31/415, 31/495, 31/445*

U.S. Cl. 424—273 R 6 Claims

1. The method for the treatment of cardiac arrhythmia in a patient comprising administering a pharmaceutical carrier and a cardiac arrhythmia inhibiting quantity of a 2-iminoimidazolidine compound corresponding to the formula:



wherein R is loweralkyl; R^1 is a member selected from hydrogen, loweralkyl, phenyl, loweralkylphenyl, and chlorophenyl; R^2 is a member selected from loweralkyl, phenyl, loweralkylphenyl, and chlorophenyl; X is a member selected from amino, diloweralkylamino, di(phenylloweralkyl)amino, 1-piperidino, 1-piperazino, 1-morpholino, and chloro; and n is the integer 1 or 2, or a pharmaceutically acceptable acid addition salt thereof.

4,327,109

NOVEL ALKADIENYLCYCLOPROPANECARBOXYLATES

Toshio Mizutani, Toyonaka; Nobushige Itaya; Nobuo Ohno, both of Ikeda; Takashi Matsuo, Amagasaki; Shigeyoshi Kitamura, and Yositosi Okuno, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

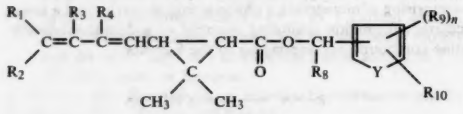
Division of Ser. No. 642,920, Dec. 22, 1975, Pat. No. 4,229,469, which is a division of Ser. No. 265,494, Jun. 23, 1972, Pat. No. 3,954,814. This application Apr. 22, 1980, Ser. No. 142,698

Claims priority, application Japan, Jun. 28, 1971, 46/47444

Int. Cl.[3] **A01N** *43/10, 53/00;* **C07C** *69/587;* **C07D** *333/16*

U.S. Cl. 424—275 **11 Claims**

1. A compound of the formula,



wherein R_1, R_2, R_3 and R_4 are respectively hydrogen or methyl, R_8 is hydrogen or ethynyl, R_9 is hydrogen, halogen or alkyl, R_{10} is halogen, alkyl, alkenyl, alkynyl, benzyl, thenyl, furylmethyl, phenoxy, methyl-, methoxy- or chlorine-substituted phenoxy or phenylthio, Y is sulfur or —CH=CH—, and n is 1 or 2 provided that when Y is sulfur, R_9 and R_{10} may be bonded at the ends to form a trimethylene chain.

11. A process for controlling insects, characterized by contacting the insects with the compound according to claim **1**.

4,327,110

PESTICIDAL SYMMETRICAL N-SUBSTITUTED BIS-CARBAMOYLOXIMINO DISULFIDE COMPOUNDS

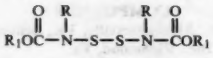
Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 28, 1977, Ser. No. 781,997

Int. Cl.[2] **A61K** *31/33, 31/385;* **C07D** *407/2, 409/2*

U.S. Cl. 424—277 **8 Claims**

1. A compound of the formula:



wherein:

R is alkyl having from 1 to 4 carbon atoms;

R_1 is

wherein

A is a divalent alkylene chain having from 2 to 24 aliphatic carbon atoms completing a 2-oximino-1,4-dithiane, 2-oximino-1,3-dithiane, 4-oximino-1,3-dithiolane, 2-oximino-1,4-dioxane, 2-oximino-tetrahydro-1,4-thiazine-3-one, 2-oximino-1,3-dithiolane, 2-imino-4-oximino-1,3-dithiolane, 3-oximinothiophane, 2-oximinothiophane, 2-oximino-tetrahydro-1,4-oxazine-3-one, 2-oximino-1,3,5-trithiane, 4-oximino-1,3,5-oxathiane, 2-oximino-1,4-oxathiane, 4-oximino-1,3-oxathiolane, 2-oximino-thiazolidin-3-one, 2-oximino-1,3-thiazolidin-4-one or 2-oximino-tetrahydro-1,4-thiazine-5-one ring structure wherein sulfur may be in any of its oxidation states.

2. N,N'-Bis-[1,4-Dithiane-2-(O-(M-methylcarbamoyl)oximino]disulfide.

4. A method of controlling insects, mites and nematodes which comprises subjecting them to an insecticidally, miticidally or nematocidally effective amount of a compound according to claim **2**.

4,327,111

N-SUBSTITUTED MERCAPTOACYL PRIPIONAMIDES

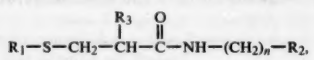
Joseph E. Sundeen, Yardley, Pa., and Tamara Dejneka, Skillman, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 14, 1980, Ser. No. 168,933

Int. Cl.[3] **A61K** *31/335;* **C07D** *323/02;* **A61K** *31/265, 31/16*

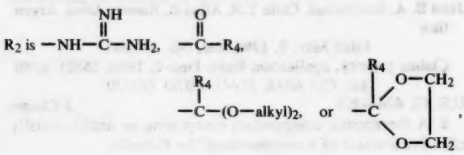
U.S. Cl. 424—278 **16 Claims**

1. A compound having the formula



or a salt thereof, wherein

R_1 is hydrogen, alkanoyl, or arylcarbonyl;



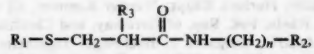
wherein R_4 is hydrogen, alkyl or aryl;

R_3 is alkyl of 3 to 8 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, aryl or arylalkyl; and

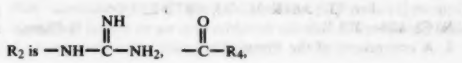
n is an integer of 1 to 20;

wherein the term "aryl" refers to phenyl or phenyl substituted; with 1, 2 or 3 alkyl, alkoxy, halogen, amino, hydroxy or alkanoyloxy groups; the terms "alkyl" and "alkoxy" refer to groups having 1 to 8 carbon atoms; and the term "alkanoyl" refers to groups having 2 to 10 carbon atoms.

16. A method for reducing the adverse effects of mammalian collagenase in a host mammal in need thereof, which comprises administering to said mammal an effective amount of a compound having the formula



or a salt thereof, wherein R_1 is hydrogen, alkanoyl, or arylcarbonyl;



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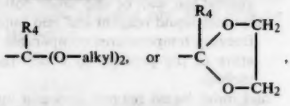


wherein R_4 is hydrogen, alkyl or aryl;

R_3 is alkyl of 3 to 8 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, aryl or arylalkyl; and

n is an integer of 1 to 20;

wherein the term "aryl" refers to phenyl or phenyl substituted; with 1, 2 or 3 alkyl, alkoxy, halogen, amino, hydroxy or alkanoyloxy groups; the terms "alkyl" and "alkoxy" refer to groups having 1 to 8 carbon atoms; and the term "alkanoyl" refers to groups having 2 to 10 carbon atoms.

4,327,112

PROCESS FOR INCREASING BLOOD PRESSURE

Richard J. Wurtman, Boston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 88,226, Oct. 25, 1979, which is a continuation of Ser. No. 898,740, Apr. 27, 1978, abandoned. This application May 2, 1980, Ser. No. 145,909

Int. Cl.³ A61K *31/195*

U.S. Cl. 424—319 **2 Claims**

1. The process for increasing blood pressure in an animal having a condition characterized by rapid firing of sympathetic neurons and low blood pressure which comprises administering to said animal a compound consisting of tyrosine in an amount effective to increase norepinephrine released into sympathetic neuronal synapses and to increase blood pressure.

4,327,113

ALKANOLAMINE DERIVATIVES

Leslie H. Smith, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 123,926, Feb. 22, 1980, Pat. No. 4,260,632, which is a division of Ser. No. 15,411, Feb. 26, 1979, Pat. No. 4,221,807, which is a division of Ser. No. 787,375, Apr. 14, 1977, Pat. No. 4,141,987, which is a division of Ser. No. 582,883, Jun. 2, 1975, Pat. No. 4,034,106. This application Dec. 12, 1980, Ser. No. 215,873

Claims priority, application United Kingdom, Jun. 5, 1974, 24837/74

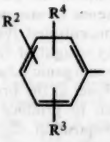
Int. Cl.³ A61K *31/18*; C07C *143/78*

U.S. Cl. 424—321 **9 Claims**

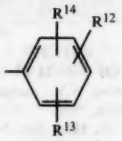
1. An alkanolamine derivative selected from a compound of the formula:

$$R.OCH_2.CHOH.CH_2NH—A—NH—X—Y—R^1$$

wherein A is alkylene of from 2 to 12 carbon atoms; wherein X is sulphonyl (—SO_2—); wherein Y is a direct link, or is alkylene or alkyleneoxy each of up to 6 carbon atoms; and wherein R is aryl of the formula:



and R^1 is aryl of the formula:



wherein R^2, R^3, R^{12} and R^{13}, which may be the same or different, each is hydrogen, halogen, hydroxy, amino, nitro or cyano, or alkyl, hydroxyalkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, alkylthio, cycloalkoxy, alkenyloxy, alkynyloxy or alkanoyl each of up to 6 carbon atoms or aryl, aryloxy or dialkylamino each of up to 12 carbon atoms; or wherein R^2 and R^3 together, and/or R^{12} and R^{13} together, form trimethylene, tetramethylene, 1-oxotetramethylene, propenylene, but-2-enylene or buta-1,3-dienylene such that together with the adjacent benzene ring they form respectively indanyl, 5,6,7,8-tetrahydronaphthyl, 5-oxo-5,6,7,8-tetrahydronaphthyl, indenyl, 5,8-dihydronaphthyl or naphthyl; wherein R^4 is hydrogen or amidic of the formula:

$$R^{15}R^{16}N—CO—Q—$$

$$R^{15}R^{16}N—CO—NH—Q—$$

$$R^{15}R^{16}N—CO—Q^1—O—$$

$$R^{16}—X^1—NR^{15}—Q—$$

or

wherein X^1 is carbonyl or sulphonyl, wherein Q is a direct link or is alkylene or alkenylene each of up to 6 carbon atoms; wherein Q^1 is alkylene of up to 6 carbon atoms; wherein R^{15} is hydrogen or alkyl of up to 6 carbon atoms; wherein R^{16} is hydrogen or alkenyl, cycloalkyl, hydroxyalkyl or alkoxyalkyl each of up to 6 carbon atoms, or alkyl, aryl, aralkyl or aralkenyl each of up to 10 carbon atoms; and where R^{14} is amidic as defined above for R^4; and an acid-addition salt thereof.

8. A method for the treatment or prophylaxis of heart diseases and hypertension in a warm-blooded animal which comprises administering to said animal an effective amount of at least one compound claimed in claim 1.

4,327,114

SUBSTITUTED 1,8-DIHYDROXY-9-(10H)ANTHRACENONES

Rolf Brickl, Warthausen, and Hans Eberhardt, Biberach, both of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

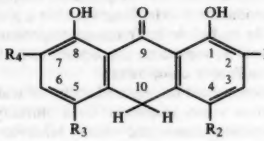
Filed Jan. 8, 1981, Ser. No. 223,335

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1980, 3002089

Int. Cl.³ A61K *31/12*; C07C *50/34*

U.S. Cl. 424—331 **9 Claims**

1. A compound of the formula



wherein R_1, R_2, R_3 and R_4 are each hydrogen, halogen, branched alkyl of 3 to 12 carbon atoms or cycloalkyl of 3 to 12 carbon atoms, provided, however, that at least one of R_1 to R_4 is other than hydrogen.

8. A topical dermatologic pharmaceutical composition con-

sisting essentially of an inert pharmaceutical carrier and an effective dermatologic amount of a compound of claim 1.

4,327,115

CLARIFICATION OF FRUIT JUICE WITH HONEY

Robert W. Kime, Romulus, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jun. 17, 1980, Ser. No. 160,263
Int. Cl.³ A23L *2/30, 2/34*
U.S. Cl. 426—12 **33 Claims**

1. A process for treating fresh, pasteurized, or fermented unclarified or preclarified fruit juice to clarify it and to render it stable to haze formation by mixing the juice with honey in an amount sufficient to clarify the juice and agitating the mixture for a time sufficient to clarify the juice thereby forming a clarified juice and a precipitate and separating the clarified juice from the precipitate mixing the juice with honey and a clarifying enzyme in a total amount sufficient to clarify the juice and agitating the mixture for a time sufficient to clarify the juice thereby forming a clarified juice and a precipitate and separating the clarified juice from the precipitate.

4,327,116

BAKERY PRODUCTS CONSISTING PREDOMINANTLY OF BRAN AND METHOD OF PRODUCING THEM

Alois Weith, Vienna, Austria, assignor to STAMAG Stadkauer Malzfabrik Aktiengesellschaft, Vienna, Austria

Filed Dec. 19, 1978, Ser. No. 970,988
Claims priority, application Austria, Dec. 22, 1977, 9226/77
Int. Cl.³ A21D *8/00;* **A23L** *1/168*
U.S. Cl. 426—19 **20 Claims**

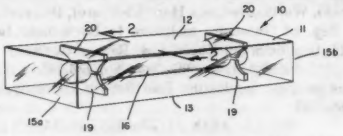
1. A bakery product consisting predominantly of bran which has been obtained by baking a shaped dough, said dough comprising prior to baking, 100 parts by weight of bran selected from the group consisting of wheat bran, rye bran and mixtures thereof, from 200 to 300 parts by weight of water, and from 2.5 to 15 parts by weight of vegetable thickening agent which is carob bean flour.

4,327,117

THAW INDICATOR FOR FROZEN FOODS

Roger D. Lenack, 20357 Tuba St., Chatsworth, Calif. 91311, and Isidore J. Lenack, deceased, late of Reseda, Calif. (by Nellie S. Lenack, executrix)

Filed Mar. 18, 1980, Ser. No. 131,530
Int. Cl.³ A22C *17/10;* **G01K** *11/06*
U.S. Cl. 426—88 **14 Claims**



1. A thaw indicator for frozen products adapted to be attached to the product and to indicate whether a product which has been kept at or below its freezing temperature has been permitted to thaw at some time subsequent to its initial freezing, said thaw indicator comprising:

an outer hollow vessel having a plurality of walls;

an inner hollow vessel suspended by a plurality of spaced support retaining means and wholly received within said outer hollow vessel;

an inner liquid reagent adapted to be initially contained within said inner hollow vessel;

an outer liquid reagent adapted to be contained within the space between said two hollow vessels;

said inner liquid reagent completely filling said inner hollow vessel so as to provide a uniform outward pressure force against the wall of said inner hollow vessel;

said inner liquid reagent and said outer liquid reagent having freezing temperatures comparable to the freezing temperature of the product to which the thaw indicator is attached;

said inner liquid reagent and said outer liquid reagent producing an irreversible chemical reaction when intermixed;

said outer liquid reagent and said inner liquid reagent having their freezing temperatures so related to each other that:

(a) during an initial decrease in ambient temperature which causes the product to be frozen and which further causes both reagents to enter their respective solid states, said outer liquid reagent reaches its freezing point and enters its solid state upon freezing and thereby increases it pressure before said inner reagent reaches its freezing point and enters its solid state upon freezing so that the wall of said inner hollow vessel does not rupture, fracture or otherwise lose its integrity as the barrier between said outer liquid reagent and said inner liquid reagent because the inward pressure from the initially frozen outer liquid reagent is resisted by the inner liquid reagent which completely fills said inher hollow vessel and the outward pressure from the subsequently frozen inner liquid reagent is resisted by the inward pressure from the previously frozen outer liquid reagent; and

(b) upon an appropriate increase in temperature which causes the product to thaw, said outer liquid reagent will thaw first and enter its liquid state first because it is closer to the exterior of the thaw indicator, receives the increase in temperature first and effectively shields the inner liquid reagent, so that the resultant outward pressure from the still frozen inner liquid reagent and the resultant pressure differential then does cause said still frozen inner liquid reagent to rupture, break or otherwise destroy the integrity of said inner hollow vessel since the liquid filled outer vessel does not retain sufficient inward pressure as a liquid to resist the outward pressure, and subsequently said inner liquid reagent will thaw and enter its liquid state, and therefore both of said reagents will intermix and interract in an irreversible manner after said inner liquid reagent thaws and returns to its liquid state, said inner liquid reagent adapted to intermix or interract with said outer liquid reagent so as to visibly cause a change in the color or state of the mixture or solution then within said outer vessel;

therefore showing through at least one of said outer vessel walls if (b) has occurred that the frozen state has not been properly maintained but the frozen product has been permitted to thaw at some time subsequent to its initial freezing.

4,327,118

PROCESS FOR THE PREPARATION OF NEW LYSINE-CONTAINING SOLID COMPOSITIONS FOR ADDITION TO ANIMAL FEED

Daniel Georgen, Paris, and Jean P. Tintignac, Sceaux, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Aug. 27, 1980, Ser. No. 181,881
Claims priority, application France, Aug. 29, 1979, 79 21646
Int. Cl.³ A23K *1/16;* **A23L** *1/30*
U.S. Cl. 426—656 **10 Claims**

1. A process for the preparation of a stable lysine-containing solid particulate composition, the particles of which do not agglomerate in the presence of atmospheric moisture, which comprises treating a concentrated lysine fermentation broth containing 10 to 40% by weight of lysine and 15 to 70% by weight of water with an inorganic substance selected from the group consisting of (i) lime, in the presence of an amount of carbon dioxide sufficient to produce 2 to 30% of calcium carbonate in the final composition, (ii) precipitated magnesium carbonate, and mixtures thereof, and optionally at least one inorganic filler selected from the group consisting of silicas,

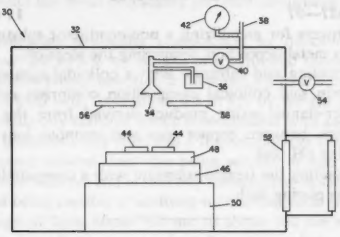
silicates and aluminosilicates, and forming solid particles of the resulting mixture to obtain a particulate solid composition containing 10 to 35% by weight of lysine and 10 to 50% by weight of the inorganic substance.

4,327,119

METHOD TO SYNTHESIZE AND PRODUCE THIN FILMS BY SPRAY PYROLYSIS

Steven A. Lis, Needham; Harvey B. Serreze, Dover, and Peter M. Sienkiewicz, Randolph, all of Mass., assignors to Radiation Monitoring Devices, Inc., Watertown, Mass.

Filed Feb. 3, 1981, Ser. No. 231,127
Int. Cl.³ B05D 1/02, 1/38
U.S. Cl. 427—74 **32 Claims**



1. In the process of making a thin film comprising preparing a first solution with first solute elements including a salt of a first constituent element of said film and spraying said solution onto a heated substrate to form a first film on said substrate, the solute and solvent elements not constituting said film forming volatile reaction products after contacting said heated substrate, the improvement wherein

said solution also includes an agent in sufficient amount to change the oxidation state of at least one said solute element after contacting said heated substrate.

4,327,120

METHOD FOR COATING A METAL SUBSTRATE

Paul A. Siemers, Clifton Park, and Harvey D. Solomon, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 28, 1981, Ser. No. 229,243
Int. Cl.³ B05D 1/08, 5/06
U.S. Cl. 427—34 **9 Claims**

1. A method which comprises, plasma or flame spraying a metal substrate with a UV sensitive indicating mixture comprising,

(A) a particulated plasma or flame sprayable hardcoat material selected from the group consisting of metal, metal carbide or metal oxide,

(B) an effective amount of a particulated UV sensitive metal oxide phosphor,

where hardcoat component (H) and phosphor component (P) of such UV sensitive indicating mixture are further characterized with respect to particle diameter D_H and D_P, respectively, in accordance with the following Energy of Melting (E_M) formula,

$$\frac{D_H}{D_p} = \frac{(E_M)_p \sqrt{\rho_p}}{(E_M)_H \sqrt{\rho_H}}$$

where D_H=diameter of hardcoat particles, D_P=diameter of phosphor particle, ρ_H=density of hardcoat particle, ρ_P=density of phosphor particle and $E_M = C_P \Delta T_M + H_f$, where C_P=specific heat, DETAL T_M=increment in temperature required to melt the particle and H_f=Heat of fusion.

4,327,121

RELEASE COATINGS

Lorin S. Gray, III, Portland, Me., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Oct. 2, 1980, Ser. No. 193,191
Int. Cl.³ B05D 3/06
U.S. Cl. 427—44 **16 Claims**

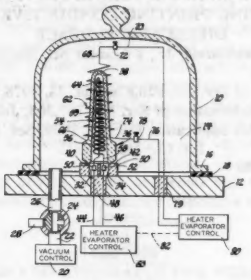
1. In a method of forming a plastic sheet or film on or against an easy release surface, setting the plastic sheet or film and stripping it from the release surface, the improvement wherein the release surface is provided by a substrate coated on at least one side with a coating composition comprising acrylic functional material which has been polymerized on the substrate by electron beam radiation, of which from about 15% to about 85% by weight of the acrylic functional material is provided by one or more aliphatic non-cyclic monofunctional acrylates having a molecular weight of from 212 to 324 before polymerization and the remainder is provided by one or more multifunctional acrylates.

4,327,122

EVAPORATED ELECTRODES FOR ZIRCONIA EXHAUST GAS OXYGEN SENSORS

Thomas Chakupurakal, St. Clair Shores, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 13, 1980, Ser. No. 177,617
Int. Cl.³ B05D 5/12
U.S. Cl. 427—57 **6 Claims**



5. A method of forming an adherent and porous metal electrode onto a surface of a zirconia exhaust gas oxygen sensor body, the improvement comprising etching the zirconia surface with an acid mixture consisting essentially of about 20–35% by volume concentrated hydrofluoric acid and the balance concentrated sulfuric acid for at least about 0.5 hour at about 180°–220° C., ultrasonically agitating the etchant for at least about an hour during etching, then heating the zirconia body to about 800°–1250° C. for at least about an hour, heating the zirconia body to about 600°–800° C. for several minutes in an evacuated chamber, evaporating electrode metal onto the hot zirconia surface from a conforming resistance heating helix having the electrode metal distributed substantially throughout its length, the helix being spaced less than about 4 mm from the zirconia surface, evaporating the metal onto the zirconia surface from the conforming resistance heating helix at a rate of about 0.5–1.0 micrometers per minute, and then maintaining the zirconia body above about 600° C. for at least 3 minutes after terminating evaporation and before exposing the evaporated metal to atmospheric pressure.

6. An apparatus for evaporating a catalytic metal electrode onto inner and outer surfaces of a hollow tapered zirconia exhaust gas oxygen sensor thimble comprising a vacuum deposition chamber and associated evacuation means, a support in the chamber for the thimble, inner and outer resistance heating coils conforming to said inner and outer surfaces respectively, said coils each being of intertwined strands of tungsten and

catalytic metal, and means for regulating electrical current passing through the coils to successively preheat the zirconia thimble, evaporate the catalytic metal onto the zirconia thimble and post-heat the zirconia thimble.

4,327,123

METHOD OF METALLIZING A PHOSPHOR SCREEN

Aaron W. Levine, Lawrenceville; Kazimiera D. Tomeczek, Hamilton Square, both of N.J., and Stanley A. Harper, New Providence, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 20, 1981, Ser. No. 236,243

Int. Cl.³ H01J *29/22*; B05D *1/38, 7/22, 3/02*

U.S. Cl. 427—64 **8 Claims**

1. A method of metallizing a phosphor screen including the steps of

(a) coating said phosphor screen with an aqueous emulsion containing an acrylic copolymer,

(b) drying said coating, thereby forming a volatilizable substrate on said phosphor screen,

(c) depositing a metal layer on said substrate and then

(d) volatilizing said substrate, characterized in that said copolymer consists essentially of about

34 to 80 weight percent of one member of the group consisting of methyl methacrylate and ethyl methacrylate,

20 to 60 weight percent ethyl acrylate and

1 to 14 weight percent methacrylic acid.

4,327,124

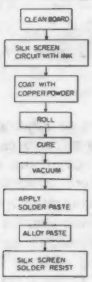
METHOD FOR MANUFACTURING PRINTED CIRCUITS COMPRISING PRINTING CONDUCTIVE INK ON DIELECTRIC SURFACE

Raymond C. DesMarais, Jr., 1 Mansur St., North Chelmsford, Mass. 01863

Continuation of Ser. No. 928,876, Jul. 28, 1978, abandoned, which is a continuation of Ser. No. 707,365, Jul. 21, 1976, abandoned. This application Dec. 13, 1979, Ser. No. 103,157

Int. Cl.³ H05K *3/12*

U.S. Cl. 427—96 **6 Claims**



1. The method of making an electrically conductive circuit on a dielectric surface, comprising the steps of

(a) printing a stratum of electrically conductive ink comprising a pre-mixed composition of a phenolic thermosetting resin, electrically conductive metal powders of approximately 325 mesh and an oxide reducing acid catalyst on said surface in a predetermined circuit pattern of relatively low electrical conductivity, said resin, said powders and said catalyst being present in said ink by weight percent respectively of approximately 23%, 71% and 6%,

(b) applying and embedding a stratum of electrically conductive metal particles of approximately 325 mesh over and into said ink stratum prior to the curing thereof,

(c) curing said ink stratum, and,

(d) printing and alloying a stratum of electrically conductive solder over said metal particle stratum and applying sufficient heat thereto to alloy said solder to said metal particle stratum to form a solderable circuit pattern of relatively high electrical conductivity.

4,327,125

COLLOIDAL COMPOSITIONS FOR ELECTROLESS DEPOSITION COMPRISING COLLOIDAL COPPER-STANNIC OXIDE PRODUCT

Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540

Division of Ser. No. 938,890, Aug. 31, 1978, Pat. No. 4,265,942, which is a continuation-in-part of Ser. No. 672,044, Mar. 30, 1976, abandoned, which is a division of Ser. No. 607,506, Aug. 26, 1975, Pat. No. 3,993,799, which is a continuation-in-part of Ser. No. 512,224, Oct. 4, 1974, abandoned. This application Apr. 4, 1980, Ser. No. 137,448

Int. Cl.³ C23C *3/02*

U.S. Cl. 427—97 **11 Claims**

1. A process for metallizing a non-conductor substrate by electroless metal deposition comprising the steps of:

(1) contacting said substrate with a colloidal composition, wherein said colloidal composition comprises colloidal copper-stannic oxide product derived from the redox reaction between copper ions and stannous ions in an alkaline pH, and

(2) contacting the treated substrate with a compatible electroless plating bath.

4,327,126

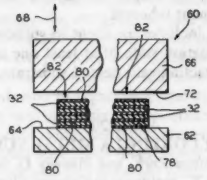
METHOD OF MAKING PRINTED CIRCUIT BOARDS

Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321

Filed Nov. 10, 1980, Ser. No. 205,108

Int. Cl.³ C23C *3/02*

U.S. Cl. 427—97 **10 Claims**



1. In the method of making printed circuit boards that are to include a dielectric substrate having printed circuitry applied thereto in a pattern defined by a film of electrically conductive metal electrolessly plated on the substrate that is electroplated over in conformity to such pattern, with the remainder of the film being etch removed from the substrate,

the manner of making the substrate which comprises the steps of:

hot setting a thermosetting resin and filler mixture to form and cure the substrate in planar configuration defining opposed side faces forming the substrate side surfacings, with the cure being limited to the resin B stage cure,

catalyzing at least one side surfacing of the substrate,

then electrolessly plating said substrate one side surfacing with the film of electrically conductive metal,

then taking a plurality of said substrates, stacking them with elastomeric sheets in intercalated relation therebetween, with one of said elastomeric sheets engaged with each said one side surfacing, in coextensive relation therewith, for each substrate in the stack, and subjecting said stack to compressive pressure, acting normally of said substrates and said sheets, and heat, to hot pressure set said substrates to cure same through their C stage cure, while, in the case of each substrate, compressing said film thereof against said one side surfacing thereof with uniform pressure over

said one side surfacing thereof through the elastomeric sheet engaging same.

4,327,127

PROCESS FOR MAKING TRANSFER ELEMENTS

George P. Dapp, and Michael A. Scott, both of Huntington, N.Y., assignors to Columbia Ribbon & Carbon Mfg. Co., Inc., Plainview, N.Y.

Division of Ser. No. 963,856, Nov. 27, 1978, Pat. No. 4,238,549. This application Jun. 16, 1980, Ser. No. 159,737

Int. Cl.³ B41M 5/00

U.S. Cl. 427—146 4 Claims

1. A method for producing a pressure-sensitive transfer element adapted to transfer solid fluorescing images to a copy sheet under the effect of imaging pressure comprising the steps of:

(a) preparing a coating composition by dissolving from about 2.6 to 6% by weight of a synthetic thermoplastic resinous binder material, from about 2.6 to 6% by weight of a hard wax, from about 4.3 to 9% by weight of a non-volatile oily material which is compatible with and softens or plasticizes said wax, and a fluorescing dye in a volatile organic solvent, said dye being soluble in said resinous binder material and in said oily material and in said solvent and being capable of emitting intense radiation within the range of from about 300 mu to about 700 mu when exposed to a light source rich in ultraviolet radiation, at least a portion of said hard wax being insoluble in said solvent, to provide a coating composition having a solids content within the range of from about 13% to about 20%;

(b) applying said coating composition as a uniform thin layer to a smooth plastic film foundation; and

(c) evaporating said volatile organic solvent to form a solid, complete transfer imaging layer containing said fluorescing dye in the form of a solid solution.

4,327,128

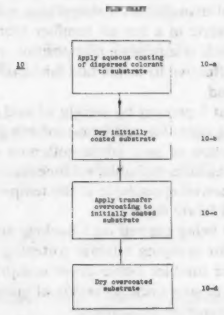
TRANSFER COATING METHODS, COMPOSITIONS AND PRODUCTS

John F. Thurlow, Gorham, Me., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Dec. 7, 1979, Ser. No. 101,346

Int. Cl.³ B41M 3/12

U.S. Cl. 427—153 27 Claims



1. The method of coating a substrate for the transfer of impressions which comprises applying two coatings to said substrate wherein:

(a) one of the coatings is wax-free and contains colorant,

(b) the other of the coatings is continuous and includes wax or wax-like material as the only organic ingredient,

thereby to provide greater image definition and intensity than coating alone.

4,327,129

METHOD OF MAKING LASER BEAM OPTICAL DECOUPLING ELEMENT FOR AN ASTABLE LASER RESONATOR

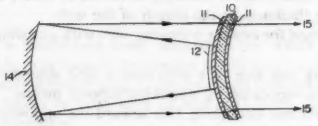
Gunther Sepp, Ottobrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 912,388, Jun. 5, 1978, abandoned, which is a division of Ser. No. 794,739, May 9, 1977, abandoned, which is a continuation-in-part of Ser. No. 620,798, Oct. 8, 1975, abandoned. This application Jan. 7, 1980, Ser. No. 109,925

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1974, 2449123

Int. Cl.³ B05D 5/06

U.S. Cl. 427—164 1 Claim



1. A method for producing an optical decoupling element for a laser beam to have a diffraction limited divergence in an astable laser resonator having a given configuration, comprising the steps of preparing a substrate of a material which is transparent to the respective laser radiation, said preparing including grinding and polishing the front and rear surfaces of said substrate, providing a mask with a mathematically computed boundary configuration such that said optical element has a diffraction limited divergence characteristic, and using said mask with said boundary configuration by securing said mask to one surface of said substrate so that said boundary configuration of the mask separates a central area from an outer area on said substrate surface, and vapor depositing a highly reflective layer on said substrate, whereby said high reflective layer covers one of said areas and the respective other area remains transparent to the respective laser radiation.

4,327,130

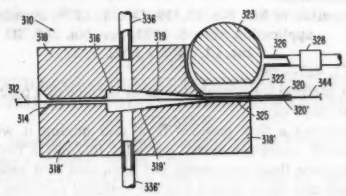
METHOD AND APPARATUS FOR FORMING A COATING ON BOTH SIDES OF A SUBSTRATE

David J. Pipkin, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 53,143, Jun. 27, 1979, abandoned, said Ser. No. 53,143, is a continuation-in-part of Ser. No. 882,281, Feb. 23, 1978, abandoned. This application Nov. 17, 1980, Ser. No. 207,590

Int. Cl.³ B05D 3/12

U.S. Cl. 427—209 20 Claims



1. Apparatus for coating a moving web with a coating liquid, the apparatus comprising:

a pair of stationary smoothing films mounted one on each side of the moving web;

a backing surface adapted to engage at least a portion of one of said smoothing films opposite the moving web so as to guide the web in a fixed-position path of travel;

a pair of metering means to meter a coating liquid to both sides of the web through at least one orifice which is positioned adjacent the confluence of the smoothing films and the web, whereby the web may be coated on both sides with the properties of the coatings being independently controlled; and

first pliant pressure generating means positioned to bear against at least a portion of the other of said smoothing films in a manner to position said other film adjacent the web and to provide both a static force and a high-hydrodynamic-pressure coating zone between the web and both of said films, compliance of said pressure generating means to said backing surface providing a coating zone whose length, in the direction of web movement, applies said hydrodynamic pressure to the liquid for at least a critical time interval which is sufficient to insure uniform coating thickness to the length of the web.

15. A method for coating a moving web with a coating liquid comprising:

conducting one side of a web over a first smoothing film which is supported by a backing support means;

urging a second smoothing film toward the opposite side of the web by means of pliant pressure generating means;

metering a coating liquid at a predetermined rate onto both sides of the web adjacent the confluence of each smoothing film and the web; and

varying the pressure of the pressure generating means to vary the force with which the smoothing films are urged against the web.

4,327,131

METHOD OF COATING A CERAMIC SUBSTRATE

Louis E. Branovich, Howell Township, Monmouth County; Edward Daly, Keyport, both of N.J.; Albert F. Newman, Sun City, Ariz., and Willis M. Smith, Fair Haven, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 5, 1980, Ser. No. 213,435

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—229 **10 Claims**

1. Method of rapidly coating a ceramic substrate with a uniform coating of copper, said method including the steps of

(A) heating the ceramic to about 250° C.

(B) placing an aqueous slurry of an inorganic copper salt selected from the group consisting of cuprous chloride and malachite on the ceramic at that temperature, and

(C) heating the coated ceramic in a reducing atmosphere at about 800° C.

4,327,132

METHOD FOR LINING INNER SURFACE OF A PIPE

Kiyonori Shinno, 67-7, Shimaizumi 8-chome, Habikino City, Osaka, Japan

Continuation of Ser. No. 80,719, Oct. 1, 1979, abandoned. This application Mar. 5, 1981, Ser. No. 240,703

Int. Cl.³ B05D *1/02, 7/22*

U.S. Cl. 427—235 **4 Claims**

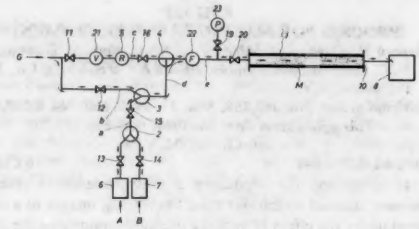
1. A method for coating the inner surface of a pipe comprising the steps of:

producing a first gaseous flow and mixing it with small, liquid, coating-material particles to form a first flowing mixture fluid containing gas from said first gaseous flow and said small, liquid coating material particles;

producing a second gaseous flow and mixing said first flowing mixture fluid therewith to produce a second flowing mixture fluid containing gas from said first and second gaseous flows and small coating material particles;

introducing said second flowing mixture fluid into a first end of the pipe to be coated;

wherein is further included the step of controlling the volume of said second gaseous flow independently of controlling the concentration of coating material particles in said first flowing mixture to control the amount of coating



material particles exiting from a downstream end of said pipe being coated.

4,327,133

ADDITIVES FOR CLOTHES DRYERS

Jerome Rudy, Livingston, N.J., and Anthony A. Rapisarda, Elmhurst, N.Y., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 853,663, Nov. 21, 1977, Pat. No. 4,238,531, which is a continuation of Ser. No. 589,993, Jun. 24, 1975, abandoned, which is a continuation of Ser. No. 376,586, Jul. 5, 1973, abandoned, which is a division of Ser. No. 158,090, Jun. 29, 1971, abandoned. This application Jun. 20, 1980, Ser. No. 161,639

The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.

Int. Cl.³ B05D *3/12*

U.S. Cl. 427—242 **10 Claims**

1. An article of manufacture for applying a fabric softening agent to damp fabric in a hot air tumbler fabric dryer in the drying cycle which comprises a composition comprising:

a. an amount effective to soften said fabric of a fabric softening agent; and

b. at least about 5 percent by weight of said composition of a distributing agent for said fabric softening agent wherein the combination of said fabric softening agent and said distributing agent is meltable, sublimeable, soluble, softenable, or otherwise spreadable at the temperatures encountered in said fabric dryer;

said composition being carried on a backing strip or sheet.

6. A method for applying a fabric softening agent to damp fabric in a hot air tumbler fabric dryer comprising adding to said fabric in the drying cycle an article of manufacture which comprises a composition comprising:

a. an amount effective to soften said fabric of a fabric softening agent; and

b. at least about 5 percent by weight of said composition of a distributing agent for said fabric softening agent wherein the combination of said fabric softening agent and said distributing agent is meltable, sublimeable, soluble, softenable, or otherwise spreadable at the temperatures encountered in said fabric dryer;

said composition being carried on a backing strip or sheet.

4,327,134

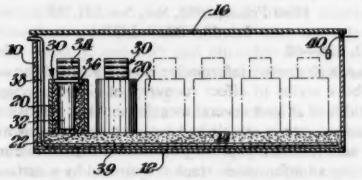
STRIPPING OF DIFFUSION TREATED METALS

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 98,654, Nov. 29, 1979, Pat. No. 4,290,391, Ser. No. 25,456, Mar. 20, 1979, and a continuation-in-part of Ser. No. 963,313, Nov. 24, 1978, abandoned, Ser. No. 851,504, Nov. 14, 1977, and Ser. No. 752,844, Dec. 21, 1976, Pat. No. 4,208,453. This application May 6, 1980, Ser. No. 147,191

Int. Cl.[3] C23F *1/00*

U.S. Cl. 427—253 3 Claims



1. In the stripping of aluminide diffusion cases from a superalloy surface by treatment with an aqueous solution of fluoride-containing nitric acid, the improvement according to which that treatment is followed by treatment with a bath consisting essentially of aqueous fluoride-free nitric acid and having a concentration between about 10 and about 30% by weight, for at least about 5 minutes.

4,327,135

SHEET-GUIDING FOIL AS A COVERING FOR IMPRESSION CYLINDERS

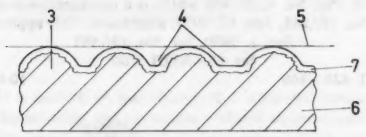
Arno Wirz, Bammental; Peter Sobotta, Heidelberg; Franz Arendt, Walldorf, and Otto K. Gramlich, Mannheim, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Filed Apr. 18, 1980, Ser. No. 141,670

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1979, 2916505

Int. Cl.[3] B41F *1/20*

U.S. Cl. 428—600 3 Claims



1. A sheet-guiding foil as a sheath for an impression cylinder in rotary offset perfecting presses, comprising a chemically resistant, wear-resistant and rigid backing layer with good ink transfer behavior formed entirely of nickel, chrome-nickel-steel or a plastic material having a high modulus of elasticity, said backing layer having a smooth rear surface and a front surface integrally formed with spherical calottes of equal height and of statistically uniform distribution, and a thin chromium layer applied to said front surface formed with said spherical calottes for evening out microroughness.

4,327,136

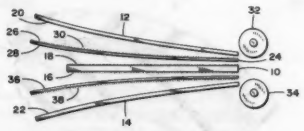
POLYMERIC MULTI-LAYER SHEET MATERIAL AND TRAY

Kenneth P. Thompson, Canton, N.C., and Richard C. Ihde, Strongsville, Ohio, assignors to Champion International Corporation, Stamford, Conn.

Filed Aug. 27, 1980, Ser. No. 181,769

Int. Cl.[3] B65D *5/00*

U.S. Cl. 428—35 10 Claims



1. In a multi-layer sheet material from which containers adapted to heat food in microwave ovens may be erected, said sheet material comprising a core layer and separate transparent surface layers on both sides of said core layer, the improvement comprising:

(a) a single ply intermediate layer located between said core layer and at least one of said adjacent surface layers, said intermediate layer being a relatively thin layer of polyethylene terephthalate, and

(b) a design printed on each side of said intermediate layer whereby said design is visible through the adjacent surface layer and is prevented by said adjacent surface layer from being physically contacted.

4,327,137

MULTILAYERED HOLLOW CONTAINER

Yuji Sawa; Shigeru Endo, and Tsutomu Uehara, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 30,714, Apr. 16, 1979, abandoned. This application Sep. 30, 1980, Ser. No. 192,443

Claims priority, application Japan, Apr. 28, 1978, 53-50922

Int. Cl.[3] B32B *1/02, 27/06*

U.S. Cl. 428—35 4 Claims

1. A multi-layered hollow container having a wall comprising at least one layer of a thermoplastic polyester and at least one layer of a polycarbonate,

said layer of thermoplastic polyester and said layer of polycarbonate being intra-dielaminated, co-extruded and then direct-blown prior to solidifying to form the multi-layered hollow container having a permeability coefficient to gaseous oxygen of less than 15 ml/m^2-day-atom, and a tensile secant modulus of elasticity of more than 10 kg/mm^2 at 1% strain and at a temperature of 80° C.,

the thickness of said layer of a polycarbonate being more than 10 micrometers and 5 to 60% of the total thickness of the wall of said multi-layered hollow container.

4,327,138

APPLICATION OF AMBIENT TEMPERATURE CURED POLYMERS OR PREPOLYMERS TO A CURED ELASTOMER

Walter R. Hausch, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 73,760, Sep. 10, 1979, abandoned. This application Jun. 30, 1980, Ser. No. 164,127

Int. Cl.[3] F16L *11/12;* B32B *25/04, 25/12, 25/14*

U.S. Cl. 428—36 12 Claims

1. A repaired tire having a laminate in the form of a filled tire opening, comprising:

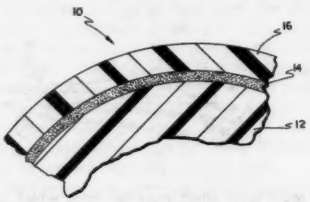
a cured elastomeric tire substrate having an opening therein, the surface of said opening being clean,

at least one treating agent layer effectively bonded to the

surface of said opening, said treating agent layer selected from the group consisting of an N-halohydantoin, an N-haloamide, and an N-haloimide, and

an opening filling amine curable polymer or prepolymer effectively bonded to said treating agent layer at ambient temperature.

7. A repaired radiator hose having a laminate in the form of a filled hose opening, comprising:



a cured elastomeric hose substrate having an opening therein, the surface of said opening being clean,

at least one treating agent layer effectively bonded to the surface of said opening, said treating agent layer selected from the group consisting of an N-halohydantoin, an N-haloamide, and an N-haloimide, and

an opening filling amine curable polymer or prepolymer effectively bonded to said treating agent layer at ambient temperature.

4,327,139

RIGID MAGNETIC RECORDING DISK HAVING PERFLUOROPOLYETHER LUBRICANT

Dieter Schaefer, Lindenberg; Herbert Motz, Willstaett; Dieter Mayer, Ludwigshafen; Paul Deigner, Willstaett; Joachim Hack, Ludwigshafen, and Roland Falk, Achern, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 15, 1979, Ser. No. 66,556

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1978, 2839378

Int. Cl.[3] **G11B** *5/82;* **B32B** *7/02, 27/00*

U.S. Cl. 428—65 **2 Claims**

1. A magnetic recording medium which comprises a rigid-disk base and a magnetizable layer applied to at least one side thereof and containing magnetic particles finely dispersed in a polymeric binder and additives, and which possesses a lubricating coating on the surface of the magnetic layer, wherein the lubricating coating consists of a layer, of from 1 to 20 mg/m^2, of one or more perfluoropolyether oil mixtures selected from the group consisting of

(a) a perfluoropolyether oil mixture of the general formula

$$A{-}O{-}(C_3F_6O)_m{-}(CF_2O)_n{-}(CF{-}O)_q{-}B \quad (1)$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad |$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad CF_3$$

where m is an integer from 15 to 100, n is an integer from 1 to 80, q is an integer from 1 to 9, the sum (m+n+q) is an integer from 17 to 100, the ratio of n to m+q is from 0.06 to

1:1, $-C_3F_6O-$, $-\underset{\displaystyle CF_3}{\overset{|}{CF_2O}}-$ and $-CF_2-O-$

are oxyperfluoroalkylene units distributed at random along the chain, and A and B are identical or different groups selected from amongst $-CF_3$, $-C_2F_5$ and $-C_3F_7$, and

(b) a perfluoropolyether oil mixture of the general formula

$$A{-}O{-}(C_2F_4O)_p{-}(CF_2O)_r{-}B \quad (2)$$

where p is an integer from 30 to 300, r is an integer from 5 to 300, the sum (p+r) is an integer from 35 to 600, the ratio of r to p is from 0.15 to 1.5:1, $-C_2F_4O-$ and $-CF_2O-$ are oxyperfluoroalkylene units distributed at random along the chain and A and B are $-CF_3$ or $-C_2F_5$.

4,327,140

HIGH DENSITY INFORMATION DISC LUBRICANTS

Joseph R. Preston, Radnor, Ohio, assignor to RCA Corporation, New York, N.Y.

Filed Feb. 5, 1981, Ser. No. 231,750

Int. Cl.[3] **B32B** *3/02*

U.S. Cl. 428—65 **5 Claims**

1. In a high density information record adapted for use with a playback stylus to effect recovery of signals occupying a bandwidth of at least several megahertz when relative motion at a desired rate is established between said record and said stylus, said record comprising a disc of a conductive material containing an information track constituted by a surface relief pattern in said track to accommodate recovery of signals of said bandwidth upon establishment of relative motion at said rate, said record coated with a methyl alkyl siloxane lubricant having the formula

$$(CH_3)_3SiO\left[\begin{array}{c}CH_3\\|\\Si{-}O\\|\\R_1\end{array}\right]_x\left[\begin{array}{c}CH_3\\|\\SiO\\|\\R_2\end{array}\right]_y Si(CH_3)_3$$

wherein R_1 and R_2 are alkyl groups of 4–20 carbon atoms, x is an integer of 2–4, y is an integer of 0–2 and wherein the sum of x plus y is 4 or less, the improvement which comprises adding to said lubricant an amino alkoxy silane compound of the formula

$$H_2N{-}R_1{-}Si(OR_2)_3$$

wherein R_1 is an alkylene group and R_2 is an alkyl group of up to 12 carbon atoms.

4,327,141

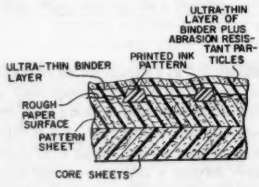
ABRASION-RESISTANT LAMINATE

Herbert I. Scher, and Israel S. Ungar, both of Randallstown, Md., assignors to Nevamar Corporation, Odenton, Md.

Division of Ser. No. 966,921, Dec. 6, 1978, Pat. No. 4,263,081, which is a continuation of Ser. No. 959,404, Nov. 9, 1978, abandoned, and a continuation-in-part of Ser. No. 879,848, Feb. 22, 1978, Pat. No. 4,255,480, which is a continuation-in-part of Ser. No. 758,265, Jan. 10, 1977, abandoned. This application Apr. 1, 1980, Ser. No. 136,581

Int. Cl.[3] **B32B** *3/00*

U.S. Cl. 428—148 **10 Claims**



1. In an abrasion-resistant decorative laminate meeting NEMA abrasion resistance standards and also capable of with-

standing 175–200 cycles of initial wear in the same test, comprising:

a backing layer and laminated thereto a thermoset laminating resin impregnated decorative facing sheet, said decorative facing sheet having a print design thereon and an ultra-thin abrasion-resistant coating having a thickness of up to about 0.2 mils over said print design, said ultra-thin abrasion-resistant coating comprising a mixture of (1) an abrasion-resistant hard mineral of particle size 20–50 microns in high concentration sufficient to provide for abrasion resistance without interfering with visibility and (2) a stabilizing binder material for said mineral which binder is compatible with said thermoset resin impregnated throughout said print sheet, said binder not interfering with visibility, and with said ultra-thin abrasion-resistant coating being at or near the surface of said laminate, the improvement comprising

an ultra-thin layer having a thickness of up to about 0.3 mils of binder material impregnated with said thermoset resin and located either directly over the print design surface of said decorative facing sheet beneath said ultra-thin abrasion-resistant coating, or above said abrasion-resistant coating.

4,327,142

METHOD OF MANUFACTURING GOODS OF LAMINATES AND GOODS SO MANUFACTURED

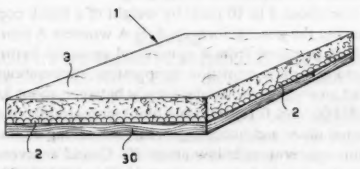
Vittorio Norzi, Via S. Carlo 131, Rho (Milan), Italy

Filed Nov. 19, 1979, Ser. No. 95,370

Claims priority, application Italy, Dec. 6, 1978, 30570 A/78; Dec. 6, 1978, 69791 A/78

Int. Cl.³ B32B *27/14*

U.S. Cl. 428—198 **9 Claims**



9. In a method of manufacturing a laminated construction panel by injecting and expanding a plastic material onto a face of a base layer in a mold, the improvement which comprises improving the bond obtained between the base layer and the injected, expanded layer by wetting said face of said base layer, before the injection and expansion step, with a liquid volatile solvent, applying onto said wetted face a layer of pre-expanded pellets of a plastic thereby partially dissolving the pellets so as to cause them to stick to said base layer, evaporating the solvent through the interstices between the pellets and thereafter carrying out the injecting and expanding of said plastic material on the layer of pre-expanded beads, said plastic material being compatible with said beads thereby achieving a stable and durable bond between the injected and expanded plastic material and said base layer.

4,327,143

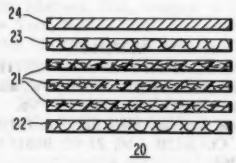
MOISTURE RESISTANT LAMINATES IMPREGNATED WITH AN IMPREGNATING COMPOSITION COMPRISING EPOXY RESIN AND A DICYANDIAMIDE DERIVATIVE

William M. Alvino, Penn Hills; Janet L. Hammill, King of Prussia, and Martin P. Seidel, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 23, 1981, Ser. No. 228,016

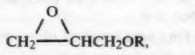
Int. Cl.³ B32B *7/00*; H05K *1/00*; C09J *5/02*; B05D *3/02*

U.S. Cl. 428—236 **15 Claims**



1. A process for producing a resin impregnated, B-staged glass fabric sheet material free of crystal formations, comprising the steps of:

(A) impregnating glass fabric material with a low solvent resin system comprising an epoxy resin and an amount of curing agent, in organic solvent solution, effective to cure the epoxy resin to the C-stage, the curing agent consisting essentially of the reaction product of dicyandiamide and an aminophylic reagent selected from the group consisting of aldehydes, ketones, alkyl mono glycidyl ethers having the formula:



where R=an alkyl group having from 1 to 4 carbon atoms, acetone, styrene oxide, ethylene oxide, propylene oxide, acetic anhydride, benzoyl chloride, acetyl chloride, and mixtures thereof, where the weight ratio of curing agent: organic solvent is between about 1:4 to 7,

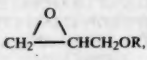
(B) removing excess resin from the glass fabric material, and

(C) heating the impregnated glass fabric material to remove solvent and to partially cure it and form a B-staged sheet where said B-staged sheet is free of crystal formation.

5. The process of claim **1**, wherein the greeness of the resin-impregnated sheet material is from about 0.5% to about 15%, and where a plurality of cut, resin-impregnated sheets are stacked on top of each other, and consolidated under heat and pressure into a unitary, bonded laminate free of crystal formations.

7. A resin impregnated, B-staged glass fabric material, suitable as a core sheet for a printed circuit board, the resin comprising an epoxy resin and an amount of curing agent effective to cure the epoxy resin to the C-stage, the curing agent consisting essentially of N-cyano-N'-hydroxymethyl guanidine, where the greenness of the resin impregnated glass fabric is from about 0.5% to about 15% and the B-staged sheet is free of crystal formations.

10. A resin impregnated, heat and pressure consolidated, completely cured circuit board, comprising a stack-up assembly of a plurality of sheets bonded together, where at least the surface sheets of the laminate are glass fabric impregnated with a resin comprising an epoxy resin and an amount of curing agent effective to cure the epoxy resin to the C-stage, the curing agent consisting essentially of the reaction product of dicyandiamide and an aminophylic reagent selected from the group consisting of aldehydes, alkyl mono glycidyl ethers having the formula:



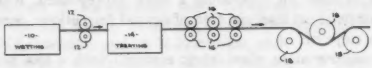
where R=an alkyl group having from 1 to 4 carbon atoms, acetone, styrene oxide, ethylene oxide, propylene oxide, acetic anhydride, benzoyl chloride, acetyl chloride, and mixtures thereof, said laminate being free of crystal formations.

4,327,144

LUBRICATOR PAD AND METHOD

Henry J. Wintringham, Virginia Beach, Va., assignor to Southland Manufacturing Co., Inc., Norfolk, Va.

Filed Aug. 26, 1980, Ser. No. 181,350
Int. Cl.³ B32B *7/00, 23/00;* **B05D** *3/02*
U.S. Cl. 428—264 **17 Claims**



1. A method of treating cloth wicking material for use in a lubricator pad to reduce the tendency of said cloth wicking material to wick water without impairing its ability to wick lubricant, said method comprising the sequential steps of:

(1) wetting a body of cloth wicking material;

(2) soaking said body of cloth wicking material in an aqueous treating solution containing polyethylene glycol tertdoecyl thioether; and

(3) slowly drying said body of cloth wicking material.

9. A body of cloth wicking material treated by the method of claim **1**.

4,327,145

PROCESS FOR PRODUCING SHEET MOLDING COMPOUND

Tomomasa Mitani, Izumi; Yoshimi Ogasawara, and Shunichi Hiraishi, both of Sakai, all of Japan, assignors to Dainippon Inc. & Chemicals, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 87,381, Oct. 22, 1979, abandoned. This application Aug. 6, 1980, Ser. No. 175,408
Int. Cl.³ C08K *7/14*
U.S. Cl. 428—290 **5 Claims**

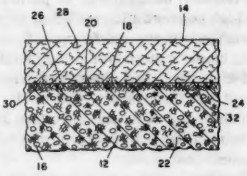
1. A process for producing an easily handleable sheet molding compound which comprises impregnating glass fibers with a resin composition comprising (A) an unsaturated polyester having a hydroxyl value of 20 to 55 and an acid value of 5 to 20 with a hydroxyl value/acid value ratio of from 1.7 to 10, (B) a polymerizable monomer and (C) a polyisocyanate compound having not more than 20 carbon atoms excepting the carbon atoms of the isocyanate groups and selected from the group consisting of diisocyanates and polymethylenepolyphenyl isocyanates, the proportions of the unsaturated polyester (A) and the polyisocyanate compound (C) being such that the mole ratio of the hydroxyl groups of the unsaturated polyester (A) to the isocyanate groups of the polyisocyanate compound (C) is from 0.7 to 1.3, and said composition being free from an oxide or hydroxide of magnesium or calcium, said impregnation being effected so that the glass fiber content becomes 40 to 75% by weight; and molding the resin-impregnated glass fibers into a sheet.

4,327,146

HIGH DENSITY INTERFACE GYPSUM BOARD AND METHOD FOR MAKING SAME

George H. White, North Tonawanda, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Oct. 27, 1980, Ser. No. 201,216
Int. Cl.³ B32B *5/14, 5/20, 13/08, 31/12*
U.S. Cl. 428—308.8 **7 Claims**



6. A paper-covered gypsum board having a gypsum core and at least one paper cover sheet adhered thereto, by the setting reaction characteristics of gypsum crystals, said gypsum core having generally therethroughout a great multiplicity of fine foam cells, and a thin layer of set gypsum at the gypsum core-paper interface which has a substantially higher density than said gypsum core, whereby a greater number of gypsum crystals are disposed in interlocking relationship with the paper, by having been formed while in contact with the paper, within interstices thereof, wherein the starch content of the gypsum core is a minor amount of no more than about 2 lbs. per thousand square feet of board per half inch of thickness.

4,327,147

SHEAR-ACTIVATED INNERSEAL

David T. Ou-Yang, Cottage Grove, Wash., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 22, 1981, Ser. No. 266,140
Int. Cl.³ B32B *5/16, 7/02, 27/18*
U.S. Cl. 156—69 **24 Claims**

20. A sheet material useful as a tamper indicating, torque-activated innerseal, said sheet material comprising a layer of foamed film having an exfoliation strength of less than about 0.17 kg/cm width and bearing, on at least one of its major surfaces at least about 0.001 gm/cm^2 of a torque-activated, tack free adhesive composition comprising

(i) from about 4 to 10 parts by weight of a block copolymer having the general formula A-B-A wherein A represents a block prepared from a monovinyl aromatic hydrocarbon having a glass transition temperature above about 20° C. and an average molecular weight between about 2,000 and 100,000, and B represents a block prepared from a conjugated diene and homologues thereof having a glass transition temperature below about 20° C. and an average molecular weight between about 10,000 and 200,000;

(ii) from about 5–20 parts by weight of an organic tackifier; and

(iii) from about 70 to 90 parts by weight of a hydrocarbon material selected from the group consisting of microcrystalline wax, amorphous polyolefin, and mixtures thereof,

wherein after said sheet material has been placed over the lip around the opening of said container with said torque-activated adhesive contacting said lip, and wherein after sufficient torque has been applied to said sheet material to shear said adhesive contacting said lip and cause said sheet material to adhere to said lip, said adhesive adheres to said lip more strongly than said adhesive adheres to said foamed film so that when said sheet material is removed from said opening, at least a portion of said adhesive remains adhered to said lip and provides a visual indication that said sheet material has been removed.

4,327,148

SELF-CONTAINED COLOR FORMING PRESSURE SENSITIVE RECORD PAPER OF THE SINGLE COATING TYPE

Kohji Toyama; Mitsuru Fuchigami; Isao Nagayasu, and Hirokazu Tsukahara, all of Takasago, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Nov. 28, 1979, Ser. No. 98,174
Int. Cl.[3] B41M 5/16
U.S. Cl. 428—320.8 **3 Claims**

1. A self-contained color forming pressure sensitive record paper of the single coating type prepared by coating a base paper sheet with a uniform coating mixture of an aqueous suspension of microcapsules containing a color former and an aqueous suspension of microcapsules containing a color developer and then drying, characterized by adding a powdered polyolefin having a particle diameter of 5 to 30μ as a microcapsule protective

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4,327,149

EXTRUDED RIGID THERMOPLASTIC SHEET HAVING OPTICALLY SMOOTH SURFACES

Tsuneyuki Katoh; Keishiro Hiraga, both of Yokohama; Junji Seki, Tokyo, and Makoto Suzuki, Kamakura, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 2,253, Jan. 10, 1979, Pat. No. 4,247,507. This application Jun. 18, 1980, Ser. No. 160,494
Int. Cl.[3] B32B 27/16, 27/30; G02C 7/02; G02F 1/29
U.S. Cl. 428—332 **4 Claims**

1. An extruded rigid thermoplastic sheet of a methyl methacrylate polymer which possesses a heat distortion temperature of at least 70° C., as measured according to ASTM-648, at a fiber stress of 18.5 kgf/cm^2, said thermoplastic sheet having optically smooth surfaces exhibiting a degree of optical distortion (δ) of from 0.03 to 0.06.

4,327,150

METHOD OF BONDING PLASTICIZED ELASTOMER TO METAL AND ARTICLES PRODUCED THEREBY

William T. White, Huntsville; Johnny M. Clemons, Trinity, and Frank E. Ledbetter, III, Huntsville, all of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 19, 1980, Ser. No. 218,585
Int. Cl.[3] B32B 15/06, 15/08; C09J 5/04
U.S. Cl. 428—332 **5 Claims**

1. The method of bonding a plasticized rubber elastomer body to a metal surface which comprises:

(a) applying a primer to the metal surface;

(b) applying an adhesive to the resulting primed surface;

(c) dissolving a portion of said plasticized rubber elastomer in an organic solvent;

(d) removing the plasticizers from the resulting solution;

(e) combining the resulting de-plasticized rubber elastomer with a portion of said adhesive to produce a liquid;

(f) casting the resulting liquid on a flat surface and allowing the cast material to dry so as to produce a sheet of deplasticized, adhesive-containing material;

(g) disposing said sheet between and in contact with the adhesive-coated metal surface and the plasticized rubber elastomer body; and

(h) heating the resulting assembly under pressure until said sheet is bonded to said surface and said body.

5. A bonded article comprising a metal substrate having adhesively bonded thereto a sheet comprising a mixture of adhesive and de-plasticized rubber elastomeric material and a rubber elastomeric body adhesively bonded to said sheet.

4,327,151

ENCAPSULATED BLEACHES AND METHODS FOR THEIR PREPARATION

Louis R. Mazzola, Mahwah, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 717,718, Aug. 25, 1976, Pat. No. 4,078,099. This application Oct. 14, 1977, Ser. No. 842,209
The portion of the term of this patent subsequent to Jan. 23, 1996, has been disclaimed.
Int. Cl.[3] B05D 7/00; C11D 7/18
U.S. Cl. 428—407 **17 Claims**

1. A coating for encapsulating granulated agents, said agents being capable of substantially passing through a U.S. sieve size of about 10 mesh and at least about 80% of said agents being substantially retained on a U.S. sieve size of about 45 mesh, comprising:

(a) about 15 to about 25% of the total encapsulate weight of a first coating on said agents consisting essentially of a major proportion of a substantially saturated fatty acid being substantially non-reactive with said agents and having a melting point range of about 85° F. to about 135° F. and a plasticizing amount of a microcrystalline wax having a melting point range of about 125° F. to about 210° F.; and

(b) about 30% to about 40% of the total encapsulate weight of a second coating on said first coating, said second coating consisting essentially of a major proportion of said fatty acid, a sufficient amount of said microcrystalline wax to plasticize said second coating and about 5 to about 20% of the total encapsulate weight of a polyoxyethylene-polyoxypropylene copolymer having at least about 65% by weight of polyoxyethylene and having a molecular weight of about 8000 to about 16,500.

7. A coating for encapsulating granulated agents, said agents being capable of substantially passing through a U.S. sieve size of about 10 mesh and at least about 80% of said agents being substantially retained on a U.S. sieve size of about 45 mesh, comprising:

(a) about 5% to about 15% of the total encapsulate weight of a first coating on said agents, said first coating consisting essentially of a major portion of a substantially saturated fatty acid being substantially non-reactive with said agents and having a melting point range of about 85% to about 135° F. and a plasticizing amount of a microcrystalline wax having a melting point range of about 125° F. to about 210° F.;

(b) about 25% to about 40% of the total encapsulate weight of a second coating on said first coated agents, said second coating consisting essentially of a major proportion of said fatty acid, a sufficient amount of said microcrystalline wax to plasticize said second coating and about 5 to about 20% by weight of the total encapsulated weight of a polyoxyethylene-polyoxypropylene copolymer having at least about 65% by weight of polyoxyethylene and having a molecular weight of about 8000 to about 16,500; and

(c) about 5% to about 15% of the total encapsulate weight of a third coating on said second coated agents, said third coating consisting essentially of a major portion of said fatty acid and a sufficient amount of said microcrystalline wax to plasticize said third coating.

13. A coating for encapsulating granulated agents, said agents being capable of substantially passing through a U.S. sieve size of about 10 mesh and at least about 80% of said

agents being substantially retained on a U.S. sieve size of about 45 mesh, comprising:

(a) about 35% to about 55% of the total encapsulate weight of a coating on said agents consisting essentially of a major proportion of a fatty acid being substantially nonreactive with said agents and having a melting point range of about 85° F. to about 135° F., a plasticizing amount of a microcrystalline wax having a melting point range of about 125° F. to about 210° F.; and

(b) about 5% to about 20% by weight of the total encapsulate weight of a polyoxyethylene-polyoxypropylene copolymer having a molecular weight of about 8000 to about 16,500.

4,327,152

PROTECTIVE COATING TO RETARD CRACK GROWTH IN ALUMINUM ALLOY

Robert N. Miller, Acworth, and Richard L. Smith, Atlanta, both of Ga., assignors to Lockheed Corporation, Burbank, Calif.

Filed Sep. 29, 1980, Ser. No. 191,371

Int. Cl.³ B32B *15/08, 27/40, 27/38;* **C23F** *11/14*

U.S. Cl. 428—419 **4 Claims**

1. A protective coating to retard crack growth in aluminum alloy when applied thereto comprising:

an amine compound which is the reaction product of hexafluoroisopropanol and cyclohexylamine mixed in a 1 to 1 molar ratio mixed with a primer in a concentration of approximately 5% by weight, said primer being a polymeric organic material mixed with a solvent and compatible with said compound with respect to the curing properties thereof of the ultimate coating; and

a low-permeability organic film topcoat overlying and covering the compound and primer mixture aforesaid.

3. The coating of claim 1 wherein said primer is a polysulfide.

4,327,153

COMPOSITE PIEZOELECTRIC MATERIAL IN THE FORM OF A FILM AND A METHOD OF FABRICATION OF SAID MATERIAL

Francois Micheron, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 15, 1980, Ser. No. 186,845

Claims priority, application France, Sep. 14, 1979, 79 22984

Int. Cl.³ B32B *27/00*

U.S. Cl. 428—421 **8 Claims**

1. A composite material endowed with piezoelectric properties by induction of electrical anisotropy, wherein said material is reinforced with at least one layer of polymer-impregnated fabric in at least one region of said material, said polymer being selected from the group consisting of polyvinylidene fluoride, polyvinyl chloride, polyvinyl fluoride, and copolymers thereof, and said electrical anisotropy having been induced by subjecting the material to a polarizing electric field normal to the faces of the material.

4,327,154

HIGH-STRENGTH COMPONENTS OF COMPLEX GEOMETRIC SHAPE AND METHOD FOR THEIR MANUFACTURE

Axel Rossmann, Karlsfeld, Fed. Rep. of Germany, assignor to Motoren- und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

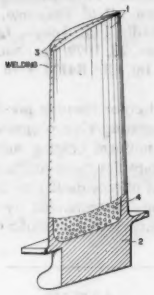
Filed Aug. 7, 1978, Ser. No. 931,381

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1977, 2737248

Int. Cl.³ B22F *3/00*

U.S. Cl. 428—545 **9 Claims**

1. A high strength component comprising a shell of the desired final shape and a core having a given shape fitting into said shell, said core being made of atomized metallic particles which are initially of substantially spherical shape having hollow spaces therein, said particles being pressed into said given shape to form said core directly in said shell whereby said metallic particles are bonded at their outer surfaces to one another and to said shell, while said hollow spaces remain



separated from one another, said shell of homogeneous metallic material permanently surrounding said core, whereby strength as well as complex geometric shapes may be attained.

4,327,155

COATED METAL STRUCTURES AND METHOD FOR MAKING

Rodney E. Hanneman, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,663

Int. Cl.³ B05D *1/08, 5/06*

U.S. Cl. 428—556 **15 Claims**

1. In the method of periodically applying a protective metallic or ceramic coating on the surface of a substrate subject to surface erosion, corrosion or wear when in use, by plasma or flame spraying the substrate surface with powdered metal or a powdered metal oxide blend whereby it is difficult to determine after a particular service period whether additional surface spraying is required, the improvement which comprises, plasma or flame spraying the substrate with a mixture of metal powder, or metal oxide powder having an effective amount of a UV sensitive phosphor to produce a UV sensitive metallic or ceramic indicating coating for signaling, upon exposure to U.V. radiation, when additional plasma or flame spraying of the metal substrate with powdered metal or powdered metal oxide should be undertaken.

4,327,156

INFILTRATED POWDERED METAL COMPOSITE ARTICLE

Kenneth R. Dillon, White Bear Lake, and Richard N. Gardner, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 12, 1980, Ser. No. 148,809

Int. Cl.³ B22F *3/00;* **C22C** *1/05*

U.S. Cl. 428—568 **37 Claims**

1. A metal composite article comprising:

(a) less than about 15 percent of the volume of said article of granules of a refractory of about 1 to about 100 micrometers mean diameter, said refractory being

(i) metal carbide, boride, oxide, silicide, or nitride,

(ii) metal selected from the group consisting of tungsten, molybdenum, tantalum, niobium, vanadium, and titanium, or

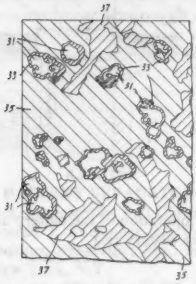
(iii) combinations thereof;

(b) a monolithic skeleton comprising about 35 to about 70 percent of the volume of said article of a solid first metal or alloy which has a homogeneous crystalline appearance at a temperature below its melting point when viewed under an optical microscope and has lower Rockwell

hardness than said refractory, said first metal or alloy fully enveloping said refractory granules, the latter being uniformly dispersed in said skeleton; and

(c) about 15 to about 50 percent of the volume of said article of a continuous metallic phase occupying the connected porosity in said skeleton, said continuous phase comprising a solid second metal or alloy which wets said skeleton, has a Rockwell hardness less than or equal to the Rockwell hardness of said first metal or alloy, and has a melting point below the melting point of said first metal or alloy;

said article thereby comprising two intermeshed matrices and being substantially free of voids.

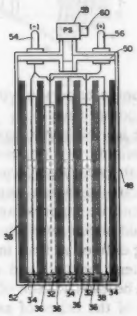


4,327,157

STABILIZED NICKEL-ZINC BATTERY

Albert Himy, University Park, Md., and Otto C. Wagner, Long Branch, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 20, 1981, Ser. No. 236,348
Int. Cl.³ H01M 2/00
U.S. Cl. 429—61 **33 Claims**



1. A sealed alkaline nickel zinc cell comprising:

A. a nickel-nickel hydroxide cathode;

B. a zinc-zinc oxide anode comprising:

(1) a corrosion inhibitor selected from the group consisting of (a) from 0.5 to 10.0 weight percent of PbO, (b) from 0.5 to 10.0 weight percent of SnO_2, (c) from more than zero to 1.0 weight percent of Tl_2O_3, (d) from more than zero to 1.0 weight percent of $In(OH)_3$, and (e) mixtures thereof, provided that the total weight percent of corrosion inhibitor does not exceed 10.0 weight percent and the weight percent of Tl_2O_3 plus $In(OH)_3$ does not exceed 1.0 weight percent;

(2) from 0.5 to 10.0 weight percent of a slight corrosion accelerator selected from the group consisting of (a) CdO, (b) Bi_2O_3, (c) Ga_2O_3, and (d) mixtures thereof, provided that the total weight percent of slight corrosion accelerators does not exceed 10.0 weight percent; and

(3) zinc active material;

wherein the weight percentages are based on the total weight of the corrosion inhibitor, slight corrosion accelerator, and zinc active material when the anode is in the uncharged state;

C. a mass transport separator;

D. an alkaline electrolyte; and

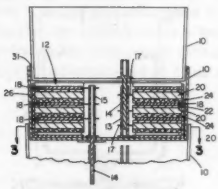
E. means for charging the cell by interrupted current wherein the charge frequency is from more than zero to 16 Hertz and the rest interval between charge pulses is a minimum of 60 milliseconds.

4,327,158

METAL/GAS BATTERY

Gerhard L. Holleck, Wayland, Mass., assignor to EIC Laboratories, Inc., Newton, Mass.

Filed Aug. 15, 1980, Ser. No. 178,523
Int. Cl.³ H01M 12/06
U.S. Cl. 429—101 **9 Claims**



1. A metal/gas battery comprising

a pressure vessel containing gas under pressure, and

within said pressure vessel, a plurality of electrode stacks, each said stack comprising an electrolyte and at least one anode/cathode pair and being contained in a cup,

each said cup comprising

a bottom portion and

an uninterrupted side wall contiguous with said bottom portion,

said cups being stacked such that, between each pair of adjacent cups, a gap is formed, said cups having hydrophobic surfaces along said gap, said gap being sufficiently large so as to allow said gas in said pressure vessel to enter each said stack, and sufficiently small so as to inhibit electrolyte bridging.

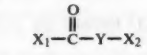
4,327,159

NON-AQUEOUS ELECTROCHEMICAL CELL

Steven D. Jones, Brook Park, and George E. Blomgren, Lakewood, both of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 29, 1980, Ser. No. 220,281
Int. Cl.³ H01M 6/14
U.S. Cl. 429—101 **9 Claims**

1. A non-aqueous cell comprising an anode, a cathode collector and a cathode-electrolyte comprising an ionizing solute dissolved in a cathodic solvent of an halogenocarbonylchalcogenyl halide as represented by the formula



where X_1 and X_2 are halogens and where Y is a chalcogen having an atomic number of 16 or more.

4,327,160
NON-AQUEOUS CELL

Steven D. Jones, Brook Park, and George E. Blomgren, Lakewood, both of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

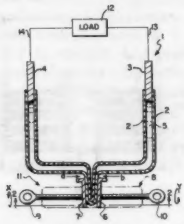
Filed Dec. 29, 1980, Ser. No. 220,282
Int. Cl.³ H01M 6/16
U.S. Cl. 429—101 **14 Claims**

1. A non-aqueous electrochemical cell comprising an anode, a cathode collector and a cathode-electrolyte solution comprising an ionizing solute dissolved in a solvent and wherein said cathode-electrolyte contains as an active cathode material an organo halide of at least one element selected from the group consisting of Group IVA and Group VA of the Periodic Table and having an atomic number of 14 or more.

4,327,161
ELECTROCHEMICAL STORAGE CELL DEVICE

Ronald P. Reitz, P.O. Box 1543, Annapolis, Md. 21404

Filed Jul. 8, 1980, Ser. No. 164,715
Int. Cl.³ H01M 6/30
U.S. Cl. 429—110 **10 Claims**



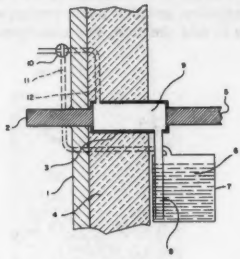
1. An electrical apparatus comprising:
(a) a first electrode means comprising the cathode of an electrochemical storage cell that utilizes an electrolyte solution,
(b) a second electrode means spaced from said first electrode means and comprising the anode of said electrochemical storage cell,
(c) a flexible non-porous electrically insulative housing means wherein said electrolyte solution and said first and second electrode means are housed such that said first and second electrode means are in physical contact with said electrolyte solution,
(d) means for bending said flexible non-porous electrically insulative housing means for forming a bent portion thereof, and
(e) means for applying pressure to said bent portion of said housing means such that said pressure is applied at various selected magnitudes so as to selectively control the flow of electrolyte ions of said electrolyte solution through said bent portion of said flexible non-porous electrically insulative housing means.

4,327,162
BATTERY TERMINAL FOR HIGH TEMPERATURE BATTERIES

Waldemar Borger, Kelkheim, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Aug. 25, 1980, Ser. No. 181,001
Claims priority, application Fed. Rep. of Germany, May 30, 1980, 2936202
Int. Cl.³ H01M 2/06, 10/50
U.S. Cl. 429—120 **7 Claims**

1. A battery terminal for high temperature batteries having a housing with heat insulation, said terminal comprising: a portion which takes the form of a hollow conductor in the region of its passage through the heat insulation of the battery housing, and said hollow interior being filld with a low melting

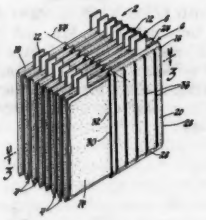


point metal during operation of the battery and being emptied of said metal during battery rest.

4,327,163
HALF-ENVELOPE SEPARATOR ASSEMBLIES ON INDIVIDUAL PLATES

Ellis G. Wheadon, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1980, Ser. No. 206,712
Int. Cl.³ H01M 2/18
U.S. Cl. 429—139 **5 Claims**



1. An electric storage battery having an electrochemically active cell element comprising:
an electrode plate having upper, lower and first and second lateral edges defining two opposing electrode faces;
an electrode sheath encasing at least part of said electrode plate, said electrode sheath comprising two sheets of microporous dendrite-suppressing battery separator material, each of said sheets overlying one of said electrode faces and being defined at least in part by peripheral borders which extend beyond and substantially parallel to said edges, said borders of each of said sheets being joined to the borders of the other of said sheets outboard said edges such as to prevent dendrite growth thereat;
a counterelectrode plate having upper, lower and first and second lateral edges defining two opposing counterelectrode faces;
a counterelectrode sheath encasing at least part of said counterelectrode plate, said counterelectrode sheath comprising two sheets of microporous dendrite-suppressing battery separator material, each of said sheets overlying one of said counterelectrode faces and being defined at least in part by peripheral borders which extend beyond and substantially parallel to said edges, said borders of each of said sheets being joined to the borders of the other of said sheets outboard said edges such as to prevent dendrite growth thereat;
an opening in each of said sheaths for ready ingress and egress of battery electrolyte to and from said sheaths during cycling; and

said respectively sheathed electrode and counterelectrode being juxtaposed in face-to-face relation such that said opening in said electrode sheath faces a direction opposite to the direction faced by the opening in said counterelectrode sheath and the respective sheaths overlap each other in the region of said element lying between adjacent plates; whereby a continuous barrier of said separator material is provided between adjacent plates, at least one sheath border is interposed between all proximate edges of adjacent plates for reduced dendrite edge growth, and electrolyte mobility within the element is enhanced.

4,327,164
BATTERY SEPARATOR

Stewart C. Feinberg, Monroeville, Pa.; Christian B. Lundsager, Ashton, Md.; Joseph T. Lundquist, Jr., Columbia, Md., and Robert A. Balouskus, Sykesville, Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 37,721, May 10, 1979, abandoned. This application Jul. 25, 1980, Ser. No. 172,400

Int. Cl.³ H01M *2/16*

U.S. Cl. 429—144 **7 Claims**

1. A battery separator having high electrical conductivity and inhibition to dendrite formation comprising a sheet formed from a substantially uniform mixture of a thermoplastic rubber, an inert filler having an average particle size ranging from about 0.01 to 10 microns, a thermoplastic rubber modifier and a processing agent selected from stearic acid, stearic acid metal salts, stearic acid amides, and natural or synthetic waxes; said thermoplastic rubber to filler being present in a volume ratio of from 10:1.5 to 10:6 and the weight percent, based on the total mixture, of said rubber modifier is from 2 to 10 weight percent and of said processing agent is from about 0.5 to 5 weight percent.

4,327,165
SEAL FOR GALVANIC ELEMENT

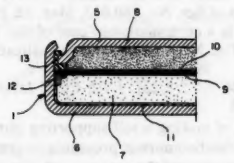
Thomas Kühl, Eppstein, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Aug. 8, 1980, Ser. No. 176,268

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936781

Int. Cl.³ H01M *2/08*

U.S. Cl. 429—174 **4 Claims**



1. A galvanic element having a rotationally symmetrical housing comprising a cup portion and a lid portion within which the active elements are contained and which is tightly sealed, said cup portion and lid portion being tightly united through a shrink force which is produced by initially bringing said portions to substantially different temperatures, and then permitting the temperatures to equalize.

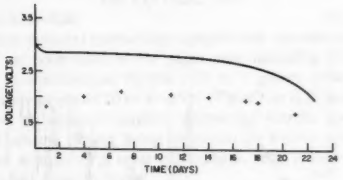
4,327,166
NONAQUEOUS CELL HAVING A MNO_2/POLY-CARBON FLUORIDE CATHODE

Violeta Z. Leger, North Olmsted, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 29, 1980, Ser. No. 191,997

Int. Cl.³ H01M *6/14*

U.S. Cl. 429—194 **8 Claims**



1. A nonaqueous cell comprising an anode selected from the group consisting of lithium, potassium, sodium, calcium, magnesium, aluminum and alloys thereof, an electrolyte of an ionizing solute dissolved in an organic solvent and a cathode, said cathode comprising manganese dioxide having a water content of less than 1 weight per cent based on the weight of the manganese dioxide; the improvement wherein a poly-carbon fluoride is added to the manganese dioxide cathode and has the formula $(C_yF_x)_n$ wherein y is 1 or 2 and x is greater than 0 up to about 1.1.

4,327,167
METHOD OF PRODUCING PRINTED CIRCUIT BOARDS

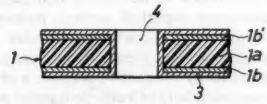
Osamu Tanabe, Nagaokakyo, Japan, assignor to Dainippon Screen Manufacturing Co., Ltd., Kyoto, Japan

Filed Nov. 14, 1980, Ser. No. 207,199

Claims priority, application Japan, Mar. 14, 1980, 55-33070

Int. Cl.³ G03G *13/22;* **B44C** *1/22*

U.S. Cl. 430—31 **2 Claims**



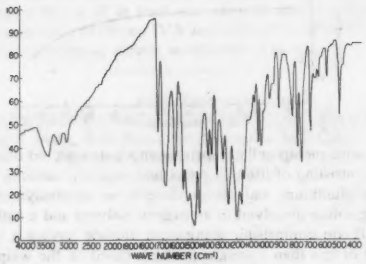
1. A method of producing printed circuit boards comprising the steps of: coating an electrophotographic photosensitive film on both sides of a synthetic resin insulating plate or substrate and on the inner wall of the holes made through the substrate at predetermined locations wherein the electrophotographic photosensitive film is coated to both sides of the entire substrate and to the inner wall of the holes without any interruption in the film, the insulating substrate having a conductive metal layer on both sides and conductive metal on said inner wall of said holes; forming a wiring pattern with acid-resistant toner on the photosensitive film by means of the electrophotography; removing the exposed parts of the photosensitive film that are not covered with the wiring patterns of the toner; etching the substrate to remove the exposed parts of conductive metal layers that are not covered with the photosensitive film and toner; and removing the remaining acid-resistant toner and the photosensitive film from the substrate.

4,327,168

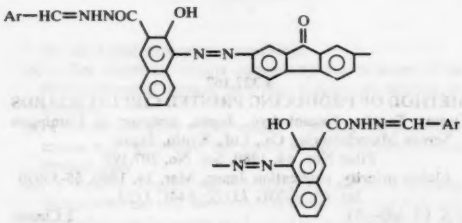
ELECTROPHOTOGRAPHIC ELEMENT CONTAINING DISAZO PIGMENT CHARGE GENERATING MATERIAL

Mitsuru Hashimoto, Numazu, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1980, Ser. No. 217,305
Claims priority, application Japan, Dec. 28, 1979, 54-170458
Int. Cl.³ G03G *5/06*
U.S. Cl. 430—57 **12 Claims**

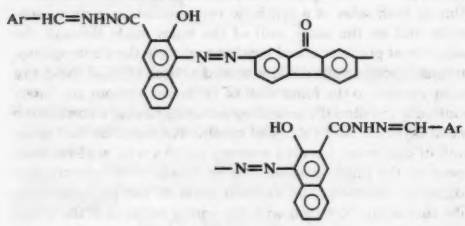


1. An electrophotographic element comprising; an electrically conductive support and a photosensitive layer superposed thereon, said photosensitive layer consisting essentially of a disazo pigment having the formula



wherein Ar is substituted or non-substituted phenyl, substituted or non-substituted naphthyl, anthryl, pyrenyl, pyridyl, thienyl, furyl or carbazolyl, and a resinous binder.

10. An electrophotographic element comprising, in successive layers, an electrically conductive support; a charge transfer layer consisting essentially of a charge transfer material and a resinous binder; and a charge generation layer consisting essentially of a disazo pigment having the formula



wherein Ar is substituted or non-substituted phenyl, substituted or non-substituted naphthyl, anthryl, pyrenyl, pyridyl, thienyl, furyl or carbazolyl.

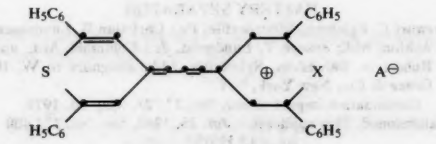
4,327,169

INFRARED SENSITIVE PHOTOCONDUCTIVE COMPOSITION, ELEMENTS AND IMAGING METHOD USING TRIMETHINE THIOPYRYLIUM DYE

Suzanne P. Clark; George A. Reynolds, and Jerome H. Perlstein, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 19, 1981, Ser. No. 226,340
Int. Cl.³ G03G *5/06*
U.S. Cl. 430—75 **14 Claims**

1. An infrared sensitive heterogeneous photoconductive composition, said composition comprising a continuous phase of a film-forming electrically insulating polymer having dispersed therein a plurality of crystalline particles consisting of an electrically insulating polymer and a trimethine thiopyrylium dye conforming to the general formula:



wherein:

X is sulfur or selenium and $A^{\ominus}$ is an anion.

4,327,170

PHOTOPOLYMERIZABLE UNSATURATED POLYESTERS AND COPYING MATERIAL PREPARED THEREWITH

Jürgen Sander, Kelkheim, and Klaus Horn, Hofheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 24, 1980, Ser. No. 220,089
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1979, 2952698
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—285 **5 Claims**

1. A photopolymerizable mixture which contains, as the essential constituents,

(a) a polymeric binder,

(b) a photoinitiator, and

(c) a polyester of an α,α'-bis-methylene-dicarboxylic acid and a dihydroxy compound.

4,327,171

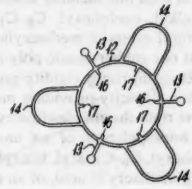
METHOD OF MAKING AN INTRA-OCULAR LENS-MOUNT ELEMENT

Stanley Poler, 78 E. Second St., New York, N.Y. 10003

Continuation of Ser. No. 858,373, Dec. 7, 1977, abandoned, which is a division of Ser. No. 780,682, Mar. 23, 1977, Pat. No. 4,080,709, which is a continuation-in-part of Ser. No. 691,033, May 28, 1976, Pat. No. 4,073,014. This application Sep. 25, 1979, Ser. No. 78,672
Int. Cl.³ B44C *1/22*; C23C *1/02*; C03C *15/00, 25/06*
U.S. Cl. 430—323 **18 Claims**

1. The method of making a self-supporting intra-ocular lens mount, which method comprises preparing to greatly enlarged scale a master plan view of the mount, said plan view being of a configuration defining a ring-like body with radially outward feet at angularly spaced locations and with lens-periphery engageable radially inward formations, selecting a thin flexible sheet of an etchable plastic material which is tolerated by the body and coating a surface thereof with photosensitive material, photographically exposing said photosensitive coating at reduced scale from said master plan view, developing the exposed coating to a positive image of the ring-like body upon

the sheet, subjecting the developed side of the sheet to an etching chemical solution, and continuing the etching process



until a substantially completed ring-like plastic blank results consistent with the positive image configuration.

4,327,172

PHOTOGRAPHIC IMAGE DEFINITION IMPROVEMENT

Charles E. Martin, Lewisville, N.C., and Ervin J. Rachwal, Framingham, Mass., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 16, 1980, Ser. No. 217,058
Int. Cl.³ G03C *5/50*
U.S. Cl. 430—407 **6 Claims**

1. A method of improving the definition of the image on a photographic emulsion, including the steps of:

exposing a pre-fogged photographic emulsion to actinic radiation representative of an object to produce in the emulsion a latent positive image of the object;

developing the positive image of the object;

bleaching the positive image from the emulsion;

generally exposing the emulsion to actinic radiation to produce a latent negative image of the object; and

developing the negative image of the object.

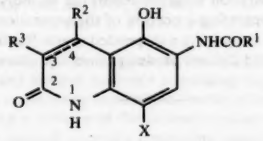
4,327,173

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Kozo Aoki; Yoshio Seoka, and Yukio Yokota, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 23, 1981, Ser. No. 227,908
Claims priority, application Japan, Jan. 23, 1980, 55-6512
Int. Cl.³ G03C *1/76, 1/40*
U.S. Cl. 430—505 **17 Claims**

1. A color photographic light-sensitive material comprising a support having coated thereon at least one silver halide emulsion layer, said photographic material containing a cyan dye forming coupler represented by formula (I)



(I)

wherein R^1 represents a substituted or unsubstituted alkyl group or a substituted or unsubstituted aryl group; R^2 and R^3 each represents hydrogen, a halogen atom, an alkyl group, an aryl group, an alkoxy group, an alkoxycarbonyl group, an alkylcarbonyl group, an arylcarbonyl group, an alkylcarbamoyl group, an arylcarbamoyl group, wherein said groups may be substituted or unsubstituted, or a nitryl group; X represents hydrogen or a coupling-off group; and the bond between the carbon atom at the 3-position and the carbon atom at the 4-position may be a single or double bond.

4,327,174

METHOD OF PREPARING A CARRIER MATERIAL FOR PHOTOGRAPHY

Walter von Meer, Bad Iburg, Fed. Rep. of Germany, assignor to Felix Schoeller, Jr., Osnabrück, Fed. Rep. of Germany

Continuation of Ser. No. 878,977, Feb. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 674,179, Apr. 6, 1976, abandoned. This application Jun. 9, 1980, Ser. No. 157,718
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1975, 2515823
Int. Cl.³ G03C *1/87*
U.S. Cl. 430—530 **18 Claims**

1. Sheet material comprising a paper core, an aqueous layer applied on both sides of the paper core including a mixture having in combination therein 0.25 to 5 grams of starch or starch derivative and 20 to 30 mVal of NaCl or KCl per square meter as an aqueous solution containing starch, said sheet material during drying being enhanced by microwave radiation and whereafter a layer of synthetic resin is coated onto said applied aqueous layer.

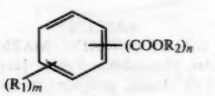
4,327,175

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Yuzo Toda; Hidetoshi Kobayashi, and Junji Koizumi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

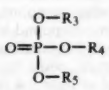
Filed Apr. 27, 1981, Ser. No. 258,215
Claims priority, application Japan, Apr. 25, 1980, 55/55084
Int. Cl.³ G03C *1/40*
U.S. Cl. 430—546 **16 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon a layer comprising a color coupler dispersed within a high boiling point organic solvent, said high boiling point organic solvent being selected from compounds of general formulae (I) and (II), and said color coupler being selected from compounds of general formulae (III) and (IV):



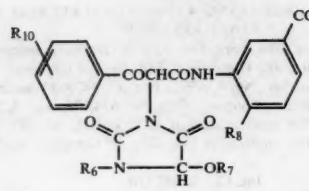
(I)

wherein R_1 is an alkyl group, an alkoxy group, an acyloxy group, an aryloxy group or a halogen atom; R_2 is a cyclic saturated hydrocarbon residue; m is 0 or an integer of 1 to 5; and n is an integer of 1 to 6; and wherein when m or n is an integer of 2 or more, each R_1 and R_2 may be the same or different;

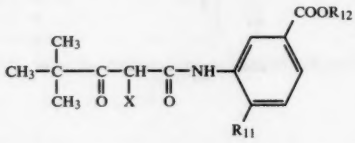


(II)

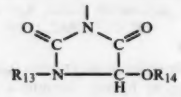
wherein R_3 is a cyclic saturated hydrocarbon residue; and R_4 and R_5, which may be the same or different, each represents a cyclic saturated hydrocarbon residue, an alkyl group or an aryl group;


(III)

wherein R_6 is an alkyl group containing 1 to 10 carbon atoms, which may be substituted with a phenyl group; R_7 is an alkyl group containing 1 to 12 carbon atoms, which may be substituted with an alkoxy group, an alkylsulfonamido group or an alkylsulfonyl group; R_8 is a chlorine atom or a methoxy group; R_9 is an alkyl group containing 10 to 20 total carbon atoms, which may be substituted with an alkoxy group, a phenoxy group, an alkoxycarbonyl group or an alkylsulfonamido group; and R_{10} is hydrogen, a methyl group or a methoxy group;


(IV)

wherein R_{11} is a chlorine atom or a methoxy group; R_{12} is an alkyl group containing 10 to 20 total carbon atoms, which may be substituted with an alkoxy group, a phenoxy group, an alkylcarbonyl group or an alkylsulfonamido group; and X is a 2,4-dioxo-5,5-dimethyl-3-oxazolydinyl group or a group having the formula:



(wherein R_{13} is an alkyl group containing 1 to 10 carbon atoms, which may be substituted with a phenyl group; and R_{14} is an alkyl group containing 1 to 10 carbon atoms, which may be substituted with an alkoxy group, an alkylsulfonamido group or an alkylsulfonyl group).

4,327,176

DRY IMAGE FORMING MATERIAL

Ryo Matsui; Tadao Matsushika; Yoshio Hayashi, and Tetsuo Shiga, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 3, 1980, Ser. No. 203,034
Claims priority, application Japan, Nov. 9, 1979, 54-144333
Int. Cl.³ G03C *1/02*
U.S. Cl. 430—619 **16 Claims**

1. A dry image forming material comprising:
(a) a non-photosensitive organic silver salt oxidizing agent;
(b) a reducing agent for silver ions;
(c) a photosensitive silver compound or a photosensitive silver compound-forming component capable of forming a photosensitive silver compound by the reaction thereof with said organic silver salt oxidizing agent (a); and
(d) a high impact acrylic resin having an Izod impact strength (notched) of at least 0.4 ft.lb/in as measured in accordance with ASTM D 256 and consisting essentially of a blend of at least on rigid thermoplastic acrylic polymer and at least one rubber-elastic polymer, or at least one copolymer comprising rigidity-providing acrylic monomer units and rubber elasticity-providing monomer units or a combination thereof with at least one rigid thermoplastic acrylic polymer and/or at least one rubber-elastic polymer; or consisting essentially of one prepared by polymerizing at least one member selected from unsubstituted C_1–C_4 alkyl, cyclohexyl, C_6–C_{10} aryl, benzyl or tetrahydrofurfuryl esters of methacrylic acid in the presence of at least one rubber-elastic polymer and/or at least one copolymer comprising rigidity-providing monomer units and rubber elasticity-providing monomer units;
said at least one rigid thermoplastic acrylic polymer being an acrylic homopolymer of an unsubstituted C_1–C_4 alkyl, cyclohexyl, C_6–C_{10} aryl, benzyl or tetrahydrofurfuryl ester of methacrylic acid, or an acrylic copolymer comprising monomer units of at least one member selected from unsubstituted C_1–C_6 alkyl, C_6–C_{10} aryl, benzyl or tetrahydrofurfuryl esters of methacrylic acid, and being of M 75 to M 120 in Rockwell hardness;
said at least one copolymer comprising rigidity-providing monomer units of at least one member selected from unsubstituted C_1–C_4 alkyl, cyclohexyl, C_6–C_{10} aryl, benzyl or tetrahydrofurfuryl esters of methacrylic acid and 0.5 to 300% by weight, based on the rigidity-providing monomer units, of rubber elasticity-providing monomer units of at least one member selected from unsubstituted C_1–C_{22} alkyl esters of acrylic acid and unsubstituted C_7–C_{22} alkyl esters of methacrylic acid.

4,327,177

METHOD AND MEANS FOR CONTROLLING THE SEX OF MAMMALIAN OFFSPRING AND PRODUCT THEREFOR

Wallace Shrimpton, 320 Judah St., San Francisco, Calif. 94122

Division of Ser. No. 564,807, Apr. 3, 1975, abandoned, which is a division of Ser. No. 814,906, Apr. 10, 1969, Pat. No. 3,894,529. This application Aug. 18, 1980, Ser. No. 179,044
Int. Cl.³ A01N *1/02*
U.S. Cl. 435—2 **13 Claims**

1. A method for separating X sperm and Y sperm according to phenotypic differences to make possible the control of the sex of mammalian offspring, comprising the steps of mixing fresh sperm with a nutrient medium; cooling the mixture of sperm and medium to a low temperature to immobilze the sperm; introducing the cooled mixture of sperm and medium to a separation medium in the form of a separate body of nutrient medium, at least part of said separation medium being substantially equivalent in density to the density of said mixture and having a uniform density gradient extending from a lightest density at the top to a heaviest density at the bottom; applying buoyant forces to the sperm introduced to said separation medium tending to separate the sperm at levels of suspension within the separation medium according to individual sperm density; and separating a portion of the separation medium of known density containing a suspended sperm fraction of equivalent density and desired predetermined sex characteristics.

4,327,178

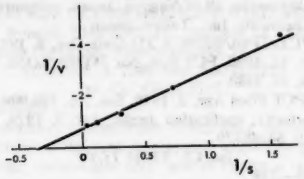
URINARY KALLIKREIN ASSAY: SPECIFIC SUBSTRATES AND ASSAY METHOD

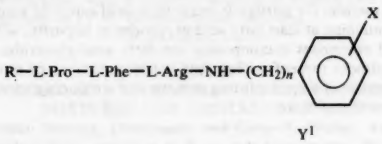
James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Continuation of Ser. No. 34,930, May 1, 1979, abandoned. This application Mar. 31, 1981, Ser. No. 249,645
Int. Cl.³ C12Q *1/38, 1/36*
U.S. Cl. 435—23 **17 Claims**

9. A method for the assay of human urinary kallikrein comprising:

mixing said kallikrein with a substrate compound having the formula





Y[1]

wherein

R is hydrogen, acetyl, benzoyl, cyclopentanecarbonly, succinyl, R_1—Ser, or R_1—Phe-Ser where R_1 is hydrogen, acetyl, benzoyl, cyclopentanecarbonyl or succinyl;

X is hydrogen, tritium, 3-iodo or 4-iodo; and,

n is 0 or 1;

at least a portion of the molecules of said substrate having a [^{3}H], [^{14}C] or [^{125}I]substituted for the C_1, H or I atoms in that portion of the substrate connected by amide linkage to the carboxy group of the arginine moiety, said substrate being present at a concentration less than 10 μm in a buffer having a pH in the range 7.5–10.5;

incubating the kallikrein with the substrate to permit kallikrein-catalyzed hydrolysis thereof;

terminating the kallikrein-catalyzed hydrolysis;

separating the hydrolysis product from the substrate; and,

measuring the amount of product formed by counting the radioactivity thereof, whereby an assay of the kallikrein activity is obtained.

4,327,179

METHOD OF BREEDING OF YEAST ON SOLUTIONS, CONTAINING LACTOSE, AND GROUND CEREAL PRODUCTS AND/OR OTHER SUGAR AND POLYSACCHARIDE PRODUCTS

Otto Moebus, Lämmerstücken 36, D-2300 Kiel-Russee; Michael Teuber, Gartenstrasse 114, D-2302 Flintbeck, and Peter Kiesbye, Zastrowstrasse 16, D-2300 Kiel, all of Fed. Rep. of Germany

Continuation of Ser. No. 858,891, Dec. 8, 1971, abandoned. This application Mar. 14, 1980, Ser. No. 130,228

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2656663; Nov. 24, 1977, 2752485

Int. Cl.[3] C12P *39/00*

U.S. Cl. 435—42 **12 Claims**

1. A process for producing yeast from dairy liquids containing lactose and natural materials containing sugars and polysaccharides, comprising in combination the steps of:

a. preparing a mixture of the lactose containing dairy liquid and the natural materials containing sugars and polysaccharides, an amylase of the type that converts starch into dextrine, and lactic acid bacteria;

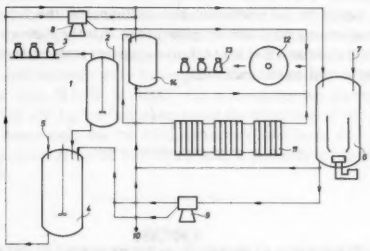
b. fermenting the lactose into lactic acid and converting the sugars and polysaccharides to dextrines, ammonia being added during this conversion to control the pH of the mixture;

c. subsequent to the lactose conversion step, adding amylase to hydrolyze the dextrines; and

d. either concomitant with or subsequent to the dextrine hydrolysis, adding a yeast to the suspension resulting from the lactose and sugar-polysaccharide and fermenting the mass under aerobic conditions, controlling the pH by addition of ammonia;

e. and further wherein the yeast fermentation step (d.) is conducted semicontinuously in two distinct repeated phases, as follows:

(i) an amount, Δg, of suspension from the lactose and starch conversion step comprising lactic acid, ammonium lactate and carbohydrates as sources for carbon and nitrogen is flowed to a fermentor during a time period Δt_1, the lactic acid concentration increasing during Δt_1 to a predetermined level;



(ii) after the lactic acid has reached said predetermined level, the flow of suspension from the lactose and starch conversion step is terminated for a time period Δt_2 to permit the lactic acid accumulated during the time period Δt_1 to become assimilated;

(iii) at the termination of Δt_2, an amount of yeast suspension equal in weight to the suspension from the lactose and starch conversion step, Δg, is withdrawn;

(iv) thereafter the process steps (1)–(iii) are repeated.

4,327,180

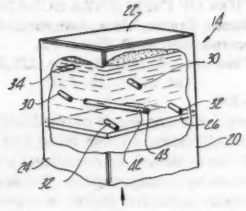
METHOD AND APPARATUS FOR ELECTROMAGNETIC RADIATION OF BIOLOGICAL MATERIAL

Kuo-Chun Chen, Birmingham, Mich., assignor to Board of Governors, Wayne State Univ., Detroit, Mich.

Filed Sep. 14, 1979, Ser. No. 75,636

Int. Cl.[3] C12N *13/00*

U.S. Cl. 435—173 **14 Claims**



1. Apparatus for subjecting biological material to electromagnetic radiation, comprising: an electromagnetic radiation source; an elongated, hollow waveguide having one of its ends connected to the radiation source; a partition extending across the waveguide to form a chamber in the waveguide on the side of the partition opposite to that directed toward the radiation source; a liquid solution disposed in the chamber so as to extend fully across the waveguide; means for maintaining fluid within the chamber at a constant temperature; and a biological material container disposed within the chamber, said container having dimensions, in the direction of propogation of the radiation, which are sufficiently small compared to the wavelength of the radiation to prevent induction of the radiation

within the container, whereby a biological sample disposed within the container is irradiated with radiation without appreciable heating.

10. The method of irradiating a biological sample with electromagnetic radiation without raising the temperature of the sample, comprising: placing the sample in an elongated container having a small cross-sectional dimension compared to the wavelength of the radiation, so that no radiation is induced into the container when the container is irradiated with the radiation; placing said container within a liquid chamber; passing radiation through the chamber in a direction transverse to the extension of the container; supporting the biological sample within the chamber in a liquid media substantially similar to the liquid in the container; and maintaining the liquid in the container at a constant temperature so that the biological specimen is maintained at said relative constant temperature while it is subjected to the radiation.

4,327,181

AEROBIC SUBMERGED FERMENTATION OF SPORULATING, ECTOMYCORRHIZAL FUNGI

John H. Litchfield, and William T. Lawhon, Jr., both of Worthington, Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed May 15, 1980, Ser. No. 150,095
Int. Cl.³ C12N *11/14*
U.S. Cl. 435—176 **5 Claims**

1. A method for mass production of sporulating, ectomycorrhizal fungi comprising inoculating a liquid growth medium with Thelephora terrestris and cultivating by aerobic submerged fermentation at a pH of between about 4.0 and 7.0 for a time sufficient to produce fungal growth.

4,327,182

PURIFICATION OF INFLUENZA SUB-UNIT VACCINE

Jorn D. Benedictus, Groton, Mass., assignor to Connaught Laboratories Incorporated, Swift Water, Pa.

Filed Jan. 22, 1981, Ser. No. 227,240
Int. Cl.³ C12N *7/02*
U.S. Cl. 435—239 **7 Claims**

1. A process for preparing a purified influenza sub-unit vaccine containing haemagglutinin (HA) and neuraminidase (NA) units from influenza virus-containing allantoic fluid which was formed by propagating the virus in a host medium, and which contains particulate matter of size ranges less than, the same as, and greater than the virus, which process comprises:

(a) subjecting said allantoic fluid to multiple selective membrane filtration to remove from said fluid undesirable dissolved solids and undesirable particulate matter in the size ranges which are less than and greater than the virus,

(b) selectively solubilizing the HA and NA units from the virus with a surfactant, and

(c) subjecting the resulting fluid to multiple selective membrane filtration to separate the haemagglutinin (HA) and neuraminidase (NA) from larger particles of virus and particulate matter and then to remove the surfactant from the HA and NA to produce the HA and NA sub-unit vaccine.

4,327,183

METHOD FOR PURIFYING FATTY ACID ESTERS OF SACCHARIDE

Takayoshi Masuda; Masaru Honjo; Tsutomu Takase, and Yoshimoto Watanabe, all of Nagoya, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

PCT No. PCT/JP80/00059, § 371 Date Dec. 5, 1981, § 102(e) Date Oct. 17, 1980, PCT Pub. No. WO80/02156, PCT Pub. Date Oct. 16, 1980
PCT Filed Apr. 3, 1979, Ser. No. 198,009
Claims priority, application Japan, Apr. 5, 1979, 54/40378; Apr. 5, 1979, 54/40379
Int. Cl.³ C07H *13/02*
U.S. Cl. 435—274 **9 Claims**

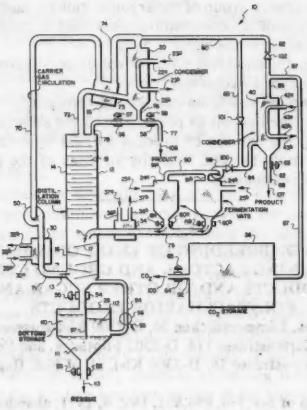
1. A method for purifying crude fatty acid esters of saccharide containing at least fatty acid glycerides as impurity, which method comprises decomposing the fatty acid glycerides by the treatment thereof with a lipid splitting enzyme or with a combination of a lipid splitting enzyme and a reducing agent in the presence of water.

4,327,184

INERT-GAS STRIPPING AND DISTILLATION APPARATUS

Steven A. Johnson, Preston, Id., and Junior D. Seader, Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Oct. 25, 1979, Ser. No. 88,254
Int. Cl.³ B01D *3/00*; C12P *7/06*
U.S. Cl. 435—287 **9 Claims**



1. A distillation apparatus comprising:

distillation means;

first condenser means connected to the distillation means for condensing a product from a carrier gas;

circulation means for circulating the carrier gas through the distillation means and the first condenser means, the carrier gas carrying the product from the distillation means to the first condenser means;

fermentation means for producing a product-containing slurry;

first conduit means for delivering the product-containing slurry from the fermentation means to the distillation means;

second condenser means connected to the fermentation means for recovering gases generated in the fermentation means;

second conduit means for delivering the gases recovered in the second condenser means to the circulation means for use as at least a part of the carrier gas;

and

first removal means for removing the product from the first condenser means.

4,327,185

REFRACTORY COMPOSITIONS WITH BINDER

Samuel B. Bonsall, Clearfield, Pa., assignor to Eltra Corporation, Morris Township, Morris County, N.J.

Filed Dec. 5, 1980, Ser. No. 213,514
Int. Cl.[3] C04B *35/52*
U.S. Cl. 501—89 8 Claims

1. A refractory composition comprising about 60 to 98 weight percent of discrete, size graded aggregate particles of high alumina, carbon and clay, and as binder a resol phenol formaldehyde resin in liquid form prior to heating and having a viscosity at 25° C. of up to about 3000 cps.

4,327,186

SINTERED SILICON CARBIDE-TITANIUM DIBORIDE MIXTURES AND ARTICLES THEREOF

Yorihiro Murata, Tonawanda, and Gary W. Weber, Amherst, both of N.Y., assignors to Kennecott Corporation, Stamford, Conn.

Filed Jun. 23, 1980, Ser. No. 161,726
Int. Cl.[3] C04B *35/56, 35/58*
U.S. Cl. 501—92 11 Claims

1. A binary composite sintered ceramic article produced under substantially pressureless sintering conditions comprising from about 80 to about 95% by weight of silicon carbide and from about 5 to about 20% by weight of titanium diboride.

5. A method of producing a composite ceramic article which comprises the steps of:

a. mixing from about 5 to about 95 percent by weight of submicron silicon carbide, from about 5 to about 95 percent by weight of finely-divided titanium diboride, from about 0.5 to about 5.0 percent by weight of carbon or a carbon source material, and from about 0.2 to about 3.0 percent by weight of a sintering aid,

b. forming the mixture into a green body in the shape of the article,

c. freeze drying and subsequently vacuum drying said green body, and

d. sintering said green body under substantially pressureless conditions to produce a sintered article comprising silicon carbide and titanium diboride.

4,327,187

METHOD OF PRODUCING SINTERED BODY OF CERAMICS

Michiyasu Komatsu; Akihiko Tsuge, both of Yokohama; Katsutoshi Komeya, Kanagawa, and Akio Ando, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 19, 1980, Ser. No. 122,659
Claims priority, application Japan, Feb. 22, 1979, 54-19013
Int. Cl.[3] C04B *35/50, 35/58*
U.S. Cl. 501—97 8 Claims

1. A sintered ceramic body having a relative density of at least 95%, a flexural strength of at least 70 Kg/mm^2 at room temperature and at least 60 Kg/mm^2 at 1200° C., and a critical thermal shock temperature of at least 400° C., produced by the process of:

admixing yttrium oxide, aluminum oxide, aluminum nitride, at least one material selected from the group consisting of titanium oxide, magnesium oxide and zirconium oxide, and silicon nitride to form a powder mixture consisting essentially of at most 10%, exclusive of 0%, by weight of yttrium oxide, at most 10%, exclusive of 0%, by weight of aluminum oxide, at most 10%, exclusive of 0%, by weight of aluminum nitride, at most 5%, exclusive of 0%, by weight of at least one material selected from the group consisting of titanium oxide, magnesium oxide and zirconium oxide, and the balance essentially of silicon nitride; shaping said powder mixture into a desired form; and sintering under a non-oxidizing atmosphere at 1500° to 1900° C.

4,327,188

MULTICELLULAR MONOLITHIC CERAMIC BODY AND PREPARATION THEREOF

Yasuhiko Endo, Yokohama; Takashi Mimori, Takasago, and Motohiro Gotō, Himeji, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Nov. 18, 1980, Ser. No. 208,002
Claims priority, application Japan, Dec. 25, 1979, 54-167666
Int. Cl.[3] C04B *35/44, 35/46, 35/50*
U.S. Cl. 501—134 20 Claims

1. A multicellular monolithic ceramic body having many gas passages partitioned by thin walls, consisting essentially of: aluminum titanate as the major constituent and from 4 to 10 wt. % SiO_2, said ceramic body having a thermal expansion coefficient less than 0.15% at 1000° C., a compressive strength greater than 350 kg/cm^2 as taken along the direction of the gas passages based only on the solid surface of said body and not including open areas of said body and a porosity of greater than 35%.

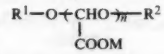
4,327,189

REVERSIBLE DEFLOCCULATION OF CLAY SLURRIES

Marvin M. Crutchfield, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 5, 1980, Ser. No. 156,703
Int. Cl.[3] C09C *1/42*
U.S. Cl. 501—148 11 Claims

1. A method for the controlled deflocculation and reflocculation of clay slurries having a pH between about pH2 and about pH9 which comprises contacting the clay slurry with a sufficient amount to deflocculate the clay slurry of a polymer having the general formula:



wherein n averages at least 4; M is selected from the group consisting of alkali metals, ammonium and alkanol amine groups having from 1 to about 4 carbon atoms; and R^1 and R^2 are individually any chemically stable group which stabilizes the polymer against rapid depolymerization in alkaline solution; and

(b) reflocculating said clay slurry when said polymer depolymerizes.

4,327,190

PROCESS FOR THE PRODUCTION OF C_1 TO C_4 OXYGENATED HYDROCARBONS

William J. Ball, Capel; Leonard Cotton, Ewell, and David G. Stewart, Epsom, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Apr. 18, 1980, Ser. No. 141,560
Claims priority, application United Kingdom, Apr. 24, 1979, 14253/79
Int. Cl.[3] C07C *27/06*
U.S. Cl. 518—714 9 Claims

1. A process for the production of oxygenated hydrocarbon compounds containing from one to four carbon atoms which process comprises contacting synthesis gas at a temperature in the range of from about 150° to 450° C. and a pressure in the range of from about 1 to 700 bars with a catalyst comprising a supported mixture essentially consisting of rhodium and chromium metals, each of said metals being present in an amount in the range of from about 0.01 to 25 weight percent based on the combined weight of the metals and support.

4,327,191

PREPARATION OF ANION EXCHANGE RESINS BY BROMINATION OF VINYL AROMATIC POLYMERS

Adrien Dromard, Paris, and Ramanadin, Ales, both of France, assignors to Rhone-Poulenc Industries, Courbevoie, France

Filed Aug. 18, 1980, Ser. No. 178,893
Claims priority, application France, Sep. 7, 1979, 79 22394
Int. Cl.[3] B01J 41/00; C08F 8/20
U.S. Cl. 521—31 14 Claims

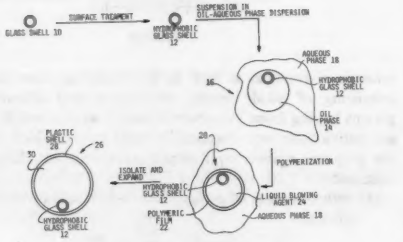
1. A process of preparing anion exchange material, which process comprises the steps: (a) polymerizing at least one alkyl vinyl aromatic monomer having at least one alkyl group containing about 1 to 3 carbon atoms in the presence of a mineral support in order to form a polymer film of less than 15 mg/m^2 on the surface of said mineral support; (b) brominating in an organic medium the alkyl groups of the polymer with a brominating agent selected from the group consisting of N-bromoamides and N-bromoimides; and (c) aminating the resulting brominated polymer.

4,327,192

METHOD OF FABRICATING NESTED SHELLS AND RESULTING PRODUCT

Timothy M. Henderson, and Lawrence B. Kool, both of Ann Arbor, Mich., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 6, 1980, Ser. No. 194,134
Int. Cl.[3] C08J 9/16
U.S. Cl. 521—56 6 Claims



1. A method of in situ microencapsulation of hollow nested shells of the type which comprise an inner shell floating within a surrounding outer shell, said method comprising the steps:

(a) surface treating a precursor shell so as to render the outer surface of said precursor shell hydrophobic,

(b) suspending the surface-treated precursor shell within the oil phase of an oil-aqueous phase dispersion, with said oil phase including an organic film-forming monomer and a liquid blowing agent, and

(c) initiating polymerization within said oil phase such that particles are formed comprising a polymeric film at the oil-aqueous phase boundary of said dispersion encapsulating said surface-treated precursor shell, and

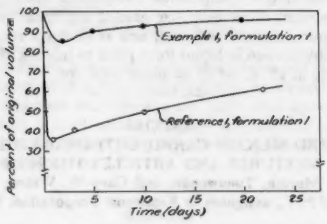
(d) heating the polymeric particle formed in said step (c) to a temperature sufficient to cause volatilization of the liquid blowing agent thereby expanding said particle to form a homogeneously integral monocellular substantially spherical polymeric shell having said precursor shell encapsulated therewithin.

4,327,193

FOAMING SYNTHETIC RESIN COMPOSITIONS STABILIZED WITH CERTAIN HIGHER ETHERS, ESTERS OR ANHYDRIDES

Tsuneo Hoki, and Yutaka Matsuki, both of Suzuka, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Mar. 6, 1981, Ser. No. 241,336
Claims priority, application Japan, Mar. 10, 1980, 55-29100
Int. Cl.[3] C08J 9/14
U.S. Cl. 521—88 7 Claims



1. A foamable synthetic resin composition comprising a normally solid aliphatic olefin polymer, a volatile organic blowing agent and 0.1 to 10 percent by weight, based on said olefin polymer of at least one compound of the formula I:

$$R_1—X—R_2 \quad (I)$$

wherein R_1 and R_2 represent an aliphatic hydrocarbon group having 3 to 24 carbon atoms, respectively, with at least one thereof having 10 or more carbon atoms, and X represents a radical selected from the group consisting of

$$-\overset{O}{\overset{\|}{C}}-O-,\ -\overset{O}{\overset{\|}{C}}-S-,\ -\overset{O}{\overset{\|}{C}}-O-\overset{O}{\overset{\|}{C}}-,\ -S-\text{ and }-O-.$$

4,327,194

FLEXIBLE POLYURETHANE FOAM PREPARED FROM A REACTION MIXTURE WHICH INCLUDES A POLYETHER TRIOL CONTAINING AN EFFECTIVELY DISPERSED FINELY DIVIDED SOLID PARTICULATE MATERIAL

Kiran B. Chandalia, Cheshire, and Henry G. Barnowski, Durham, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 6,951, Jan. 25, 1979, Pat. No. 4,278,770, which is a continuation-in-part of Ser. No. 898,274, Apr. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 881,297, Feb. 27, 1978, abandoned. This application Feb. 2, 1981, Ser. No. 230,767
Int. Cl.[3] C08G 18/14
U.S. Cl. 521—99 23 Claims

1. In a process for preparing a flexible polyurethane foam from a reaction mixture comprised of a polyether polyol, an organic polyisocyanate, a foaming agent and a reaction catalyst, said foam exhibiting a SAC factor of about 1.7 to about 2.2, the improvement wherein:

said polyether polyol is a triol having a molecular weight of about 1,000 to about 6,500 and at least 10 percent of primary hydroxyl groups and which is the product of sequentially oxyalkylating a trihydroxy alcohol first with propylene oxide or a mixture thereof with ethylene oxide and then with ethylene oxide, said triol containing a proportion of an effectively dispersed finely divided solid particulate material, said particulate material having, prior to dispersion in said triol, an average primary particle size of about 0.007 to about 10 microns and a pH ranging from about 3 to about 5, and further having, in dispersion in said

triol, an effective maximum particle size of less than about 100 microns.

4,327,195

POLYURETHANE CONTAINING POLYPEPTIDES

Gheorghe Cioca, Belleville, and Paul A. Fertell, Wilmington, both of N.J., assignors to Seton Company, Newark, N.J.

Filed Sep. 29, 1980, Ser. No. 191,863
Int. Cl.[3] C08G *18/14*
U.S. Cl. 521—102 8 Claims

1. In a composition including polyurethane foam, prepared by the reaction of a polyreactive hydrogen compound and a polyisocyanate the improvement comprising a particulate polypeptide derived from collagen incorporated into said composition.

4,327,196

METHOD FOR PRODUCING EXPANDED AND CURED POLYESTER RESIN

Robert W. West, Memphis, Tenn.; Paul E. Stott, Cheshire, and James Ahnemiller, Middlebury, both of Conn., assignors to Uniroyal, Inc., New York, N.Y. and Alpha Chemical Corporation, Colliersville, Tenn.

Filed Dec. 22, 1980, Ser. No. 219,420
Int. Cl.[3] C08J *9/00*
U.S. Cl. 521—120 18 Claims

1. A foamable and curable polyester composition consisting essentially of, all parts being by weight:

(a) 100 parts liquid unsaturated polyester resin,

(b) 2.7–32 millimoles mono-substituted sulfonyl hydrazide blowing agent for the resin having the structural formula RSO_2NHNH_2, wherein R is C_1–C_{12} alkyl, C_5–C_6 cycloalkyl, C_7–C_{10} aralkyl, phenyl, naphthyl or phenyl substituted with halogen, C_1–C_{12} alkyl or C_{1-C12} alkoxy,

(c) 0.001–2 parts organic metal salt primary promoter for the organic peroxide or organic hydroperoxide cure of the resin wherein the metal is selected from copper and vanadium,

(d) 0–0.4 part organic metal salt secondary promoter for the organic peroxide or organic hydroperoxide cure of the resin, wherein the metal is selected from cadmium, calcium, chromium, cobalt, iron, lead, lithium, manganese, nickel, tin and zirconium,

(e) 0–2 parts surface active agent,

(f) 0–250 parts filler,

(g) 0.5–2.5 parts organic peroxide or organic hydroperoxide per 100 parts (a) plus (f); provided that if the amount of (d) is zero the amount of (c) is at least 0.01 part.

4,327,197

FIRE-RETARDANT ANHYDRIDE COPOLYMERS

Adolph V. Di Giulio, and Jack N. Bauer, both of Pittsburgh, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 147,034, May 6, 1980, Pat. No. 4,304,874.
This application Aug. 5, 1981, Ser. No. 290,137
Int. Cl.[3] C08J *9/00*
U.S. Cl. 521—147 5 Claims

1. A fire-retardant foam composition having a density of between 1 and 10 pounds per cubic foot and consisting of a copolymer of 50 to 95 mole percent of a monovinyl aromatic monomer and 5 to 50 mole percent of the anhydride of an ethylenically unsaturated dicarboxylic acid monomer, from 10 to 20 parts per hundred parts of copolymer of an at least tribrominated diphenylether, and 4 to 8 parts per hundred parts of copolymer of a metal oxide synergist for the ether.

4,327,198

POLYMERIC MOLDING COMPOSITIONS HAVING THE HIGH IMPACT STRENGTH

Doyle A. Weemes, Greeneville, and Robert W. Seymour, Kingsport, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 24, 1981, Ser. No. 257,446
Int. Cl.[3] C08L *51/08*
U.S. Cl. 525—63 12 Claims

1. Composition of matter comprising

(a) a polyester derived from 100 mole % dibasic acid and 100 mole % glycol, at least 50 mole % of said dibasic acid being terephthalic acid or a mixture of a substantial amount of terephthalic acid with isophthalic acid, said glycol component comprising at least 75 mole % of one or more aliphatic or cycloaliphatic glycols having from 2 to 12 carbon atoms, said polyester having an I.V. of about 0.4–1.5,

(b) about 5 to about 35 weight %, based on the weight of the composition, of polyethylene having a melt index of about 0.1–15.0 and a density of about 0.910–0.965, and

(c) about 0.25 to about 5 weight %, based on the weight of the composition, of poly(tetramethylene terephthalate)-co-2--butene-1,4-diol having an I.V. of 0.9 to 1.5 grafted with a low density polyethylene.

4,327,199

THERMOPLASTIC CRYSTALLINE POLYESTER MODIFIED ACRYLIC COPOLYMER RUBBER

Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 19, 1981, Ser. No. 226,317
Int. Cl.[3] C08L *67/02*
U.S. Cl. 525—176 15 Claims

1. A thermoplastic composition comprising a blend of about 25 to 98 parts by weight of neutralized acid containing acrylic copolymer rubber, and about 75 to 2 parts by weight of thermoplastic crystalline polyester per 100 parts by weight of said rubber and thermoplastic crystalline polyester combined.

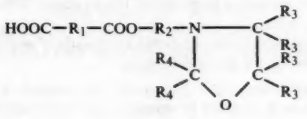
4,327,200

WATER-DILUTABLE OXAZOLIDINE GROUP CONTAINING EPOXY RESIN ESTERS, COATING COMPOSITIONS PREPARED THEREFROM, AND THEIR USE AS CATHODICALLY DEPOSITABLE PAINTS

Wolfgang Leitner; Georg Pampouchidis, and Anton Bleikolm, all of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Oct. 29, 1980, Ser. No. 201,968
Claims priority, application Austria, Nov. 5, 1979, 7082/79; April 25, 1980, 2224/80; April 25, 1980, 2225/80
Int. Cl.[3] C08L *61/32;* C08G *59/58, 63/68*
U.S. Cl. 525—531 24 Claims

1. Binders water-dilutable upon partial or total neutralization with inorganic and/or organic acids, comprising the reaction product obtained by heating an epoxy resin having at least 2 1,2-epoxy groups per molecule and an epoxy equivalent of at least 160 with a semiester of an aliphatic, cycloaliphatic, or aromatic dicarboxylic acid and an N-2-hydroxyalkyloxazolidine having the general formula—



wherein

R_1 is a saturated or unsaturated aliphatic, cycloaliphatic, or aromatic hydrocarbon radical,

R_2 is a straight chain or branched alkylene radical,

R_3 is a hydrogen atom or an alkyl radical, and

R_4 is a hydrogen atom or an alkyl radical with up to 6 carbon atoms,

the quantity of oxazolidine semiester being chosen in order that the epoxy-free final product has a theoretical amine number of at least 35 mg KOH/g.

4,327,201

CATIONICALLY POLYMERIZABLE MACROMOLECULAR MONOMERS AND GRAFT COPOLYMERS THEREFROM

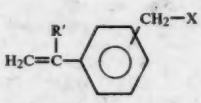
Joseph P. Kennedy, Akron, and Kurt C. Frisch, Jr., Midland, both of Mich., assignors to The University of Akron, Akron, Ohio

Filed Oct. 22, 1980, Ser. No. 199,656

Int. Cl.³ C08F *110/10*

U.S. Cl. 526—131 **18 Claims**

1. A macromolecular monomer comprising the reaction product of a cationically polymerizable monomer, said monomer being isobutylene, and a vinyl substituted hydrocarbon halide having the formula



where R′ is a hydrocarbon having from 1 to 18 carbon atoms, and where X is selected from the group consisting of F, Cl, Br, and I,

in said reaction the amount of said vinyl substituted hydrocarbon halide is from about 5.0 moles to about 1.0×10^{-5} moles per mole of said isobutylene monomer, and

wherein said macromolecular monomer has polymerizable head groups, said polymerizable head groups being vinyl or substituted vinyl groups.

4,327,202

STYRENE COPOLYMER FOR CONTACT LENSES

William M. Foley, Jr., Glendale, Calif., assignor to John D. McCarry, El Toro, Calif.

Continuation-in-part of Ser. No. 920,670, Jun. 30, 1978, Pat. No. 4,243,790, which is a continuation-in-part of Ser. No. 797,005, May 16, 1977, abandoned. This application Apr. 21, 1980, Ser. No. 142,334

The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

Int. Cl.³ C08F *212/06, 212/08, 214/18;* G02C *7/04*

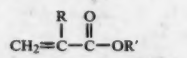
U.S. Cl. 526—245 **11 Claims**

1. A contact lens having a durometer hardness of at least about 80, a saturated hydration level of at least about 30%, being sufficiently hard and tough to be cut and polished at ambient temperature, consisting essentially of the polymerization product of the following monomers in combination with suitable cross-linking agents:

styrene monomer, comprising from about 20% to about 30% of the lens;

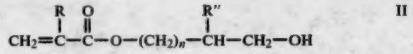
optionally including from about 1% to about 10% of methacrylic acid;

the balance of the lens consisting essentially of acrylic monomer having the general formula



I

wherein R is hydrogen, methyl or ethyl, and R′ is alkyl, and acrylic monomer having the general formula



II

wherein n is 0 or 1, R is hydrogen, methyl or ethyl, and R″ is hydrogen when n is 0 and hydrogen or hydroxyl when n is 1.

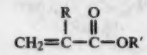
6. A contact lens having a durometer hardness of at least about 80, a saturated hydration level of at least about 20%, being sufficiently hard and tough to be cut and polished at ambient temperature, consisting essentially of the polymerization product of the following monomers in combination with suitable cross-linking agents:

vinyl toluene, comprising from about 4% to about 20% of the lens;

methylmethacrylate or lauryl methacrylate, comprising from about 1% to about 10% of the lens;

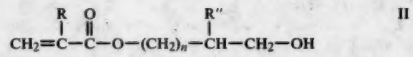
optionally including up to about 3% of methacrylic acid;

the balance of the lens consisting essentially of acrylic monomer having the general formula



I

wherein R is hydrogen, methyl or ethyl, and R′ is alkyl other than methyl methacrylate and lauryl methacrylate, or of the general formula



II

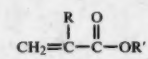
wherein n is 0 or 1, R is hydrogen, methyl or ethyl, and R″ is hydrogen when n is 0 and hydrogen or hydroxyl when n is 1.

7. A contact lens having a durometer hardness of at least about 80, a saturated hydration level of at least about 20%, being sufficiently hard and tough to be cut and polished at ambient temperature, consisting essentially of the polymerization product of the following monomers in combination with suitable cross-linking agents:

pentafluorostyrene, comprising from about 4% to about 20% of the lens;

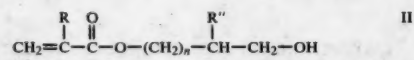
optionally including up to about 10% of methacrylic acid;

the balance of the lens consisting essentially of acrylic monomer having either the general formula



I

wherein R is hydrogen, methyl or ethyl, and R′ is alkyl, or of the general formula



II

wherein n is 0 or 1, R is hydrogen, methyl or ethyl, and R″ is hydrogen when n is 0 and hydrogen or hydroxyl when n is 1.

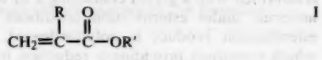
8. A contact lens having a durometer hardness of at least about 80, a saturated hydration level of at least about 20%, being sufficiently hard and tough to be cut and polished at ambient temperature, consisting essentially of the polymerization product of the following monomers in combination with suitable cross-linking agents:

pentafluorostyrene, comprising from about 4% to about 20% of the lens;

dodecafluoroheptyl methacrylate, comprising from about 4% to about 10% of the lens;

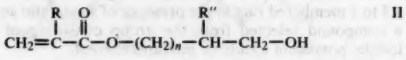
optionally including up to about 10% of methacrylic acid;

the balance of the lens consisting essentially of acrylic monomer having either the general formula



I

wherein R is hydrogen, methyl or ethyl, and R′ is alkyl, or of the general formula



II

wherein n is 0 or 1, R is hydrogen, methyl or ethyl, and R″ is hydrogen when n is 0 and hydrogen or hydroxyl when n is 1.

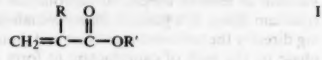
9. A contact lens having a durometer hardness of at least about 80, a saturated hydration level of at least about 20%, being sufficiently hard and tough to be cut and polished at ambient temperature, consisting essentially of the polymerization product of the following monomers in combination with suitable cross-linking agents:

styrene monomer, comprising from about 4% to about 20% of the lens;

dodecafluoroheptyl methacrylate, ethoxyethyl methacrylate, or methoxyethyl methacrylate, methyl methacrylate, or lauryl methacrylate, comprising from about 4% to about 10% of the lens;

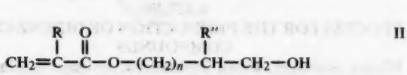
optionally including up to about 10% of methacrylic acid;

the balance of the lens consisting essentially of acrylic monomer having either the general formula



I

whereln R is hydrogen, methyl or ethyl, and R′ is alkyl other than methyl methacrylate and lauryl methacrylate, or of the general formula



II

wherein n is 0 or 1, R is hydrogen, methyl or ethyl, and R″ is hydrogen when n is 0 and hydrogen or hydroxyl when n is 1.

4,327,203

POLYSILOXANE WITH CYCLOALKYL MODIFIER COMPOSITION AND BIOMEDICAL DEVICES

William G. Deichert, Macedon; Gary D. Friends, Ontario; John B. Melpolder, Hilton, and Joon S. Park, Rochester, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Feb. 26, 1981, Ser. No. 238,522
Int. Cl.³ C08F *236/20*
U.S. Cl. 526—279 **24 Claims**

1. A shaped article suitable for use in biomedical applications being a polymer formed by polymerizing (a) one or more polysiloxane monomers α,ω terminally bonded through divalent hydrocarbon groups to an activated unsaturated group with (b) a cycloalkyl modulus modifier and (c) a tear film stabilizer to form a crosslinked three-dimensional polymeric network.

4,327,204

PROCESS FOR PRODUCING POLYURETHANE ELASTOMER BY MIXING A HARDENER COMPOSITION WITH AN ISOCYANATE COMPOSITION

Yoshijiro Oyaizu, Yaizu; Wataro Koike, Shizuoka, and Chihiro Yazawa, Yokohama, all of Japan, assignors to Ihara Chemical Industry Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1980, Ser. No. 131,555
Claims priority, application Japan, Apr. 11, 1979, 54-43000
Int. Cl.³ C08G *18/10*
U.S. Cl. 528—61 **9 Claims**

1. In a process for producing a polyurethane elastomer by mixing (a) a hardener composition containing a polyamine, a long chain polyol having an average molecular weight of 300 to 4,000 and a catalyst with (b) an isocyanate composition, an improvement characterized in that said isocyanate composition comprises a prepolymer having terminal isocyanate group and an average molecular weight of 500 to 5,000 and an organic diisocyanate monomer with or without a triisocyanate monomer and a ratio of isocyanate groups of said prepolymer to amino groups of said polyamine is in a range of 0.6:1 to 1.5:1 and a ratio of a total of isocyanate groups in said isocyanate composition to a sum of amino groups of said polyamine and hydroxyl group of said long chain polyol is in a range of 0.8:1 to 1.4:1.

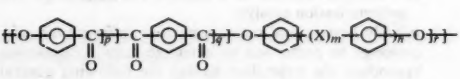
4,327,205

BULK POLYCONDENSATION PROCESS FOR PRODUCING AROMATIC POLYESTERS

Yasuyuki Kato, Niihama; Haruo Suzuki, Ibaraki; Masatsune Kondo, Niihama; Hiroaki Sugimoto, Nara; Junichi Kimura, and Zyunso Saito, both of Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 14, 1981, Ser. No. 224,881
Claims priority, application Japan, Jan. 24, 1980, 55-7543
Int. Cl.³ C08G *63/22*
U.S. Cl. 528—128 **2 Claims**

1. A process for producing by bulk polycondensation an aromatic polyester of the formula,



wherein X is a hydrocarbon radical having 1 to 20 carbon atoms, —O—, —SO_2—, —S—, or —CO—, m is 0 or 1 and n is 0 or 1; when p=0, q=r=an integer of 3 to 600; when q=r=0, p=an integer of 3 to 600; when p≠0, q≠0 and r≠0, p+q+r=3 to 600; p, q, r are integers and q=r, which comprises using a horizontal jacketed reactor provided with one or two agitator shafts bearing impellers fixed thereto and carrying out the bulk polycondensation in said reactor while circulating a heat-transfer medium through the jacket, agitator shaft(s), and, if necessary, impellers to heat or cool the reaction system to obtain a particulate material having a weight-average particle size of 0.5 to 20 mm.

4,327,206

PROCESS FOR PREPARING POLY-1,4-CYCLOHEXANEDICARBOXYLATE POLYESTERS HAVING HIGH TRANS ISOMER CONTENT

Winston J. Jackson, Jr., Kingsport, Tenn., and William R. Darnell, Weber City, Va., assignors to Eastman Kodak Co., Rochester, N.Y.

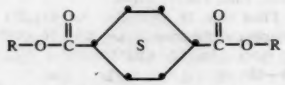
Filed Mar. 27, 1981, Ser. No. 248,586
Int. Cl.³ C08G *63/04, 63/22*
U.S. Cl. 528—179 **9 Claims**

1. Process for preparing poly-1,4-cyclohexanedicarboxylate

polyesters having a trans isomer content of at least 80 percent, the process comprising

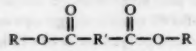
a. preparing a reaction mixture of

1. at least 50 mole percent of an alkyl or aryl diester of trans-1,4-cyclohexanedicarboxylic acid having the general formula



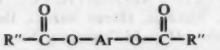
wherein the R's are the same or different and are selected from alkyl groups containing 1 to 4 carbon atoms or phenyl,

2. up to 50 mole percent of a diester of an aromatic dicarboxylic acid having the general formula



wherein the R's are the same or different and are selected from alkyl groups containing 1 to 4 carbon atoms or phenyl and R' is an aromatic ring structure containing 8 to 20 carbon atoms,

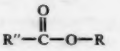
3. at least one diacyl ester of an aromatic diol having the general formula



wherein the R'"s may be the same or different and are selected from alkyl groups containing 1 to 4 carbon atoms or phenyl and Ar is the aromatic residue remaining after removal of the hydroxyl groups from an aromatic diol and may be substituted with an alkyl group containing 1 to 4 carbon atoms or phenyl and may contain two or more aromatic diol residues, and

4. a catalytic amount of a suitable ester exchange and polymerization catalyst

b. initially heating said reaction mixture sufficient for ester exchange to occur and to eliminate ester condensation byproduct, the byproduct having the following general formula



wherein R'' is an alkyl group containing 1 to 4 carbon atoms or phenyl and R is an alkyl group containing 1 to 4 carbon atoms or phenyl, and

c. reducing pressure to further remove said ester condensation byproduct and to increase the molecular weight of the polyester product.

4,327,207

PRODUCTION OF THERMALLY STABILIZED POLYESTER WITH ALKYLENE CARBONATES AND SODIUM OR POTASSIUM IODIDE

Stanley D. Lazarus, Petersburg, Va., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jun. 2, 1980, Ser. No. 155,374

Int. Cl.³ C08G *63/30*

U.S. Cl. 525—439 **9 Claims**

1. A high molecular weight linear polyester stabilized against thermal degradation comprising a polyester reacted with a thermally stabilizing amount of an alkylene carbonate having a 5 or 6 membered ring in the presence of a catalytic amount of a compound selected from the group consisting of sodium iodide, potassium iodide or mixtures thereof.

4. In a process for the preparation of a high molecular weight linear condensation polyester wherein terephthalic acid is esterified with a glycol containing 2 to 10 carbon atoms per molecule under esterification conditions and the resulting esterification product is polycondensed, the improvement which comprises providing a reduction in the free carboxyl content of the polyester to a carboxyl concentration of less than 10 gram equivalents per 10^6 grams of polyester by reacting the polyester in molten form with a thermally stabilizing amount of a stabilizer comprising an alkylene carbonate having a 5 to 6 membered ring in the presence of a catalytic amount of a compound selected from the group consisting of sodium iodide, potassium iodide or mixtures thereof.

4,327,208

CONTINUOUS PROCESS FOR THE HYDROLYTIC PRODUCTION OF POLYCAPROLACTAM HAVING A LOW-MONOMER AND LOW-DIMER CONTENT

Günter Lehr, Krefeld; Uwe Hucks, Alpen; Hugo Vernaleken, Krefeld; Werner Nielinger, Krefeld, and Erhard Tresper, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 38,510, May 14, 1979, abandoned. This application Jul. 9, 1980, Ser. No. 167,055

Claims priority, application Fed. Rep. of Germany, May 18, 1978, 2821686

Int. Cl.³ C08G *69/16*

U.S. Cl. 528—323 **7 Claims**

1. A continuous process for producing a polymer of ϵ-caprolactam having low monomer and low dimer content wherein at least 60% of the polymer consists of units from caprolactam which comprises polymerizing the monomers hydrolytically, subjecting the polymer melt thus obtained to vacuum to remove unreacted caprolactam monomer and caprolactam dimer as a gaseous phase contained therein, condensing directly the removed monomer and dimer from the gaseous phase on the melt of caprolactam to form a molten caprolactam composition which is directly subjected to said hydrolytic polymerization.

4,327,209

PROCESS FOR THE PRODUCTION OF DIBENZAZOLYL COMPOUNDS

Werner Schreiber, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

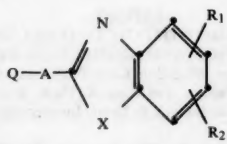
Filed Nov. 28, 1980, Ser. No. 211,481

Claims priority, application Switzerland, Dec. 6, 1979, 10829/79

Int. Cl.³ C07D *413/06, 405/04, 409/14*

U.S. Cl. 542—466 **11 Claims**

1. A process for the production of benzazolyl compounds of the formula



(I)

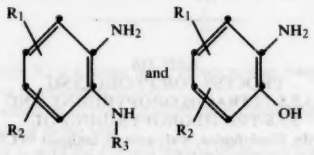
by condensation, in the presence of a solvent and a catalyst, of organic carboxylic acids of the formulae

HOOC—*B*

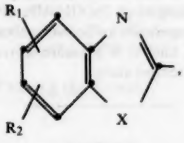
and

HOOC—B_1

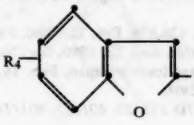
wherein B is the 5-carboxy-fur-(2)-yl radical, the HOOC—CHOH—CH_2— or HOOC—CHOH—CHOH— radical or a benzoxazol-(2)-yl radical, and B_1 is the 5-carboxy-then-(2)-yl radical, HOOC—CHOH—CH_2— or HOOC—CHOH—CHOH— radical, with aminobenzenes of the formulae



wherein R_1 is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy-lower alkyl, —COCN or —COO— lower alkyl, R_2 is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy-lower alkyl, —COCN or —COO— lower alky[1], X is oxygen or a R_3N-group, wherein R_3 is hydrogen, lower alkyl, hydroxy-lower alkyl, phenyl or benzyl, A is 2,5-furylene, 2,5-thenylene, a bridge member containing at least one double bond between 2 carbon atoms, or is the direct bond, and Q is a radical of the formula



wherein X, R_1 and R_2 are as defined above, and, if A is the direct bond, Q is also a radical of the formula



wherein R_4 is hydrogen, lower alkyl, lower alkoxy or halogen, which process comprises carrying out said condensation in a eutectic mixture of 73.5% by volume of diphenyl ether and 26.5% by volume of diphenyl as solvent.

4,327,210

THIAZOLYLACELAMIDE CEPHALOSPORINS

Marc Montavon, and Roland Reiner, both of Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

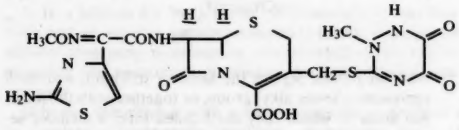
Filed Nov. 24, 1978, Ser. No. 963,255

Claims priority, application Switzerland, May 30, 1978, 5882/78

Int. Cl.[3] C07D *501/36*

U.S. Cl. 544—027 **8 Claims**

1. A compound of the formula



its easily hydrolysable esters, easily hydrolysable ethers, its pharmaceutically acceptable salts or hydrates thereof.

4,327,211

METHOD FOR PREPARATION OF CEPHALOSPORIN COMPOUNDS

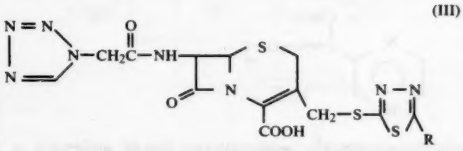
Masahiro Murakami; Masateru Kobayashi; Takanori Sone, all of Nobeoka, and Chisei Shibuya, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Nov. 26, 1980, Ser. No. 210,746

Int. Cl.[3] C07D *501/56*

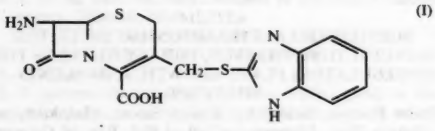
U.S. Cl. 544—27 **4 Claims**

1. A method for preparing a cephalosporin compound represented by the formula (III)



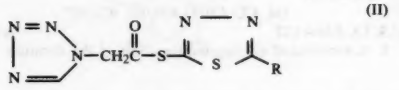
(III)

wherein R represents hydrogen or methyl group, or a pharmaceutically acceptable salt thereof, which comprises reacting 7-amino-3-(benzimidazol-2-yl)thiomethyl-3-cephem-4-carboxylic acid represented by the formula (I)



(I)

or a salt thereof with a compound represented by the formula (II)



(II)

wherein R represents hydrogen or methyl group, in the presence of an acidic catalyst.

4,327,212

ISOINDOLINE-AZINE NICKEL COMPLEX WITH PIPERAZINE

Paul Lienhard, Frenkendorf, and Francois L'Eplattenier, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

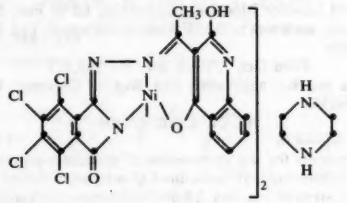
Filed May 19, 1980, Ser. No. 151,032

Claims priority, application Switzerland, May 29, 1979, 4996/79

Int. Cl.[3] C07D *403/12, 403/14*

U.S. Cl. 544—225 **1 Claim**

1. The isoindoline-azine nickel complex of the formula



4,327,213
ALPHA-HYDROCARBONOXYIMINO-PYRAZINEACETONITRILES

Jacob A. van Zorge, Ameide, Netherlands, assignor to ACF Chemiefarma VA, Netherlands

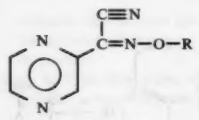
Filed Dec. 29, 1977, Ser. No. 865,484

Claims priority, application United Kingdom, Jan. 7, 1977, 0624/77

Int. Cl.³ C07D *241/12*

U.S. Cl. 544—336 **8 Claims**

1. A pyrazinyl compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein R is alkyl of 1 to 6 carbon atoms, cyanomethyl, alkenyl of 3 to 6 carbon atoms, alkynyl of 3 or 4 carbon atoms, cycloalkyl of 5 or 6 carbon atoms, or phenylalkyl of 1 to 3 carbon atoms in the alkyl group, said phenyl alkyl being unsubstituted or substituted in the phenyl ring with methoxy, chloro, nitro or cyano.

4,327,214
SUBSTITUTED ALKYLAMMONIUM SALTS, THE MANUFACTURE THEREOF, THE USE THEREOF FOR REGULATING PLANT GROWTH, AND AGENTS THEREFOR

Costin Rentzea, Heidelberg; Hubert Sauter, Mannheim, and Johann Jüng, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

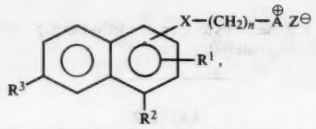
Filed Sep. 12, 1980, Ser. No. 186,602

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1979, 2940765

Int. Cl.³ C07D *487/04, 453/02*

U.S. Cl. 546—133 **4 Claims**

1. A substituted alkylammonium salt of the formula



where R^1, R^2 and R^3 are identical or different and each denotes hydrogen, C_{1-4}-alkyl, fluorine, chlorine or bromine, X is oxygen or sulfur, n denotes one of the integers 2, 3 and 4, A denotes quinuclidine or pyrrolizidine, and Z is the anion of any non-phytotoxic acid HZ.

4,327,215
PREPARATION OF ERYTHRO-α-PIPERID-2-yl-2,8-BIS-(TRIFLUORO-METHYL)-QUINOLIN-4-yl-METHANOL

Eckhard Hickmann; Heinz-Guenter Oeser, both of Ludwigshafen, and Leander Moebius, Erpolzheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 3, 1980, Ser. No. 193,473

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1979, 2940443

Int. Cl.³ C07D *401/06*

U.S. Cl. 546—176 **7 Claims**

1. A process for the preparation of erythro-α-piperid-2-yl-2,8-bis-(trifluoromethyl)-quinolin-4-yl-methanol which comprises the steps of reacting 2,8-bis-(trifluoromethyl)-quinoline-4-carboxylic acid or a salt thereof with a pyrid-2-yl-magnesium halide in a cyclic saturated ether or in an aliphatic dialkyl ether or an alkoxyalkyl ether in a molar ratio of from 1:2 to 1:8 at from 0° to 80° C. to give pyrid-2-yl 2,8-bis-(trifluoromethyl)-quinolin-4-yl ketone and the latter is hydrogenated in a conventional manner to give erythro-α-piperid-2-yl-2,8-bis-(trifluoromethyl)-quinolin-4-yl-methanol.

4,327,216
PROCESS FOR PRODUCING 2,3,5,6-TETRACHLOROPYRIDINE AND 3,5,6-TRICHLOROPYRIDIN-2-OL

Pierre Martin, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 24, 1980, Ser. No. 209,783

Claims priority, application Switzerland, Nov. 30, 1979, 10660/79

Int. Cl.³ C07D *213/61*

U.S. Cl. 546—250 **8 Claims**

1. A process for the production of a mixture of 2,3,5,6-tetrachloropyridine and 3,5,6-trichloropyridin-2-ol which comprising reacting trichloroacetic acid chloride with acrylonitrile, in an organic solvent inert to trichloroacetic acid chloride and acrylonitrile, in the presence of a catalyst selected from the group consisting of metals and metal compounds of the main group VIII or the subgroups Ib, IIb, VIa or VIIa of the periodic system, at a temperature of between about 70° and 220° C. in a closed system and at a pressure corresponding to the respective reaction temperature.

4,327,217
CYANOGUANIDINE DERIVATIVES

Satoru Tanaka, Higashi-Kurume; Katsutoshi Shimada, Tokyo; Kazunori Hashimoto, Matsudo; Kiichi Ema, and Koichiro Ueda, both of Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

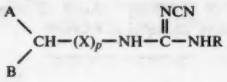
Division of Ser. No. 120,876, Feb. 12, 1980, Pat. No. 4,287,346. This application Aug. 13, 1980, Ser. No. 178,017

Claims priority, application Japan, Feb. 16, 1979, 54-15989; Feb. 16, 1979, 54-15990

Int. Cl.³ C07D *213/89, 401/12, 401/14, 295/12*

U.S. Cl. 546—281 **40 Claims**

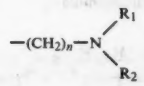
1. A cyanoguanidine derivative of the formula:



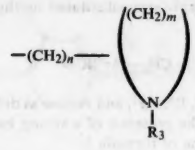
wherein A represents (1) a substituted or unsubstituted phenyl wherein the substituents are selected from the group consisting of lower alkyl, lower alkenyl, halogen, lower alkoxy, lower alkylthio, lower alkylsulfonyl and halogen substituted lower alkyl, (2) furyl, (3) thienyl or (4) cycloalky group;

B represents pyridyl or pyridine-N-oxide group;

R represents a group of the formula:



wherein R_1 and R_2 are the same or different, and each represents a lower alkyl group, or together with the nitrogen atom to which they are bonded form a member selected from the group consisting of pyrrolidine, piperidine, piperazine or morpholine, and n is an integer of 1–3, or R represents a group of the formula



wherein R_3 is a lower alkyl group, n is an integer of 1–3, and m is an integer of 4–5;

X represents an alkylene or an alkylene containing the terminal sulfur atom; and

p is 0 or 1, with the proviso that (i) when A is unsubstituted phenyl and B is pyridyl, p is 1 and (ii) when A is unsubstituted phenyl and B is pyridine-N-oxide, p is 0, or a pharamceutically acceptable acid addition salt thereof.

4,327,218

N-ARYL, 2-PHENOXY NICOTINAMIDE COMPOUNDS AND THE HERBICIDAL USE THEREOF

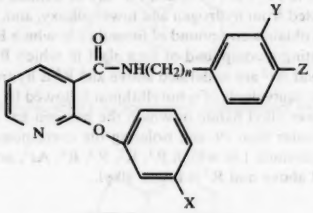
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 80,971, Oct. 1, 1979, Pat. No. 4,270,946. This application Nov. 28, 1980, Ser. No. 210,990

Int. Cl.³ C07D *213/64*

U.S. Cl. 546—291 **52 Claims**

1. A compound having the formula



in which n is 0 or 1; X is halogen, C_1–C_3 alkyl, trifluoromethyl or carboethoxy; Y and Z are independently hydrogen, lower alkyl, halo-lower alkyl, thio(halo-lower alkyl), nitro, cyano or halogen; provided that:

if X is carboethoxy, Z is halogen and Y is hydrogen or halogen; and

if Y and Z are both halogen, X is halogen, trifluoromethyl or carboethoxy.

4,327,219

NICOTINAMIDE PRODUCTION

Abraham P. Gelbein, Plainfield, N.J., assignor to The Lummus Company, Bloomfield, N.J.

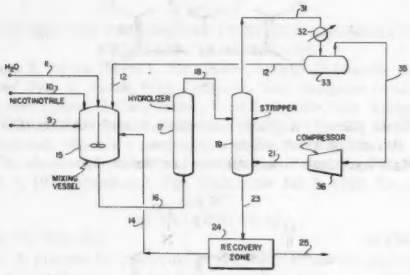
Filed Apr. 21, 1980, Ser. No. 141,943

Int. Cl.³ C07D *213/56*

U.S. Cl. 546—317 **10 Claims**

1. In a process for hydrolyzing nicotinonitrile to nicotinamide with an aqueous ammonia solution to produce an aqueous effluent containing nicotinamide, unconverted nicotinonitrile, ammonia and ammonium nicotinate, the improvement comprising:

stripping the effluent with gaseous ammonia to produce a molten nicotinamide bottoms, essentially free of nicotinonitrile, and containing less than 10 wt.% water, and an overhead containing water vapor, ammonia and nicotinonitrile; condensing from the overhead an aqueous solution of ammonia and unreacted nicotinonitrile; and



recycling the said aqueous solution of ammonia and unreacted nicotinonitrile to the hydrolyzing.

4,327,220

PROCESS FOR REDUCING PICOLINE DERIVATIVES USING COPPER CATALYST

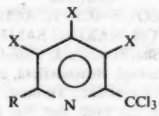
Jon A. Orvik, Danville, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 29, 1980, Ser. No. 220,392

Int. Cl.³ C07D *213/26, 213/64*

U.S. Cl. 546—345 **5 Claims**

1. A process for reducing a trichloromethyl group in the 2-position of a pyridine ring to a dichloromethyl group which comprises treating a compound corresponding to the formula



wherein each X independently represents hydrogen or chloro and R represents hydrogen, chloro, phenoxy or phenoxy substituted with one or more lower alkyl, lower alkoxy or halo groups with a stoichiometric amount of water and a catalyst which is a monovalent or divalent copper compound or metallic copper in an amount which is sufficient to catalyze said reduction and a reducing agent capable of said reduction in the presence of said copper catalyst, said treating being carried out at a temperature of from about 40° C. to about 150° C. and in the presence of a solvent for a time sufficient to convert the trichloromethyl group to a dichloromethyl group.

4,327,221

2-SUBSTITUTED-3-HYDROXYTHIAZOLO(2,3-b)-THIAZOLIUM SALTS AND MESOIONIC DIDEHYDRO DERIVATIVES THEREOF

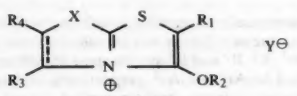
Peter H. L. Wei, Springfield, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Oct. 15, 1980, Ser. No. 197,357

Int. Cl.³ C07D *277/60*

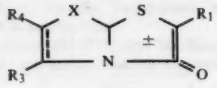
U.S. Cl. 548—154 **11 Claims**

1. A compound having the formula:



or

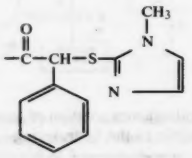
-continued



wherein

R_1 is phenyl or phenyl substituted with chloro, fluoro, bromo or lower alkyl;

R_2 is hydrogen, lower alkanoyl or the group



R_3 is hydrogen, alkoxycarbonylalkyl of 3 to 10 carbon atoms, phenyl or phenyl substituted with fluoro, chloro, bromo or lower alkyl;

R_4 is hydrogen or alkoxycarbonylalkyl of 3–10 carbon atoms;

X is CH_2, S or NR_5, wherein R_5 is hydrogen or lower alkyl; and

Y is a halide and

where the dotted line represents an optional double bond in the 5,6-position.

4,327,222

3,4-DIARYLISOXAZOL-5-ACETIC ACIDS AND PROCESS FOR MAKING SAME

Ronald G. Micetich, Sherwood Park; Chia-Cheng Shaw, Edmonton, and Ram B. Rastogi, Beaconsfield, all of Canada, assignors to CDC Life Sciences Inc., Toronto, Canada

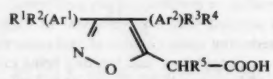
Filed Sep. 23, 1980, Ser. No. 190,060

Claims priority, application Canada, Oct. 5, 1979, 337097

Int. Cl.³ C07D *261/08;* A61K *31/42*

U.S. Cl. 548—247 **24 Claims**

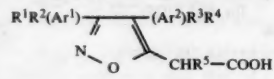
1. A compound of the formula 1



1

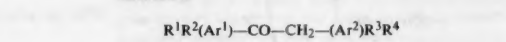
and pharmaceutically acceptable salts thereof in which Ar^1 and Ar^2 are the same or different and are selected from phenyl and naphthyl, R^1, R^2, R^3 and R^4 are the same or different substituents attached to Ar^1 and Ar^2, respectively, and are selected from hydrogen, halogen, trifluoromethyl, lower alkyl, and lower alkoxy, and R^5 is selected from hydrogen, lower alkyl, and lower alkoxy, with the term "lower" denoting the presence of 1–4 carbon atoms in a straight or branched chain.

15. A process for preparing a compound of the formula 1



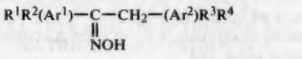
1

and pharmaceutically acceptable salts theory in which Ar^1 and Ar^2 are the same or different and are selected from phenyl and naphthyl, R^1, R^2, R^3 and R^4 are the same of different substituents attached to Ar^1 and Ar^2, respectively, and are selected from hydrogen, halogen, trifluoromethyl, lower alkyl, and lower alkoxy, with the term "lower" denoting the presence of 1–4 carbon atoms in a straight or branched chain, which comprises treating an aryl-(aryl-substituted methyl)-ketone of the formula 2



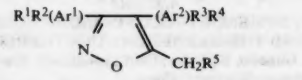
2

in which R^1, R^2, R^3, R^4, Ar^1, and $Ar^2$are as defined above with hydroxylamine in the presence of a strong base to obtain the corresponding oxime of formula 3



3

in which R^1, R^2, R^3, R^4, Ar^1, and Ar^2 are as defined above, treating said last-named oxime with two molar equivalents of n-butyllithium followed by treatment with a lower alkyl ester of an acid of the formula $R^5COOAlk$ in which R^5 is selected from hydrogen and lower alkoxy and Alk is lower alkyl, to obtain the corresponding isoxazole of the formula 4



4

in which R^1, R^2, R^3, R^4, Ar^1, and Ar^2 are as defined above and R^5 is selected from hydrogen and lower alkoxy, treating said last-named compound with 1.0–1.1 molar equivalents of n-butyllithium followed by treatment with solid carbon dioxide, and isolating the corresponding compound of formula 1 in which R^1, R^2, R^3, R^4, Ar^1, and Ar^2 are as defined above and R^5 is selected from hydrogen and lower alkoxy; and, when it is desired to obtain a compound of formula 1 in which R^5 is lower alkyl, treating a compound of formula 1 in which R^1, R^2, R^3, R^4, Ar^1, and Ar^2 are as defined above and R^5 is hydrogen with two molar equivalents of n-butyllithium followed by treatment with a lower alkyl halide in which the halogen has an atomic weight greater than 19, and isolating the corresponding compound of formula 1 in which R^1, R^2, R^3, R^4, Ar^1, and Ar^2 are as defined above and R^5 is lower alkyl.

4,327,223

PROCESS FOR PRODUCING 1,3-DITHIOL-2-YLIDENE MALONATES

Hisanori Matsui, Nishinomiya; Hiroshi Tanaka; Kunihiro Yabutani, both of Neyagawa, and Hitoshi Kurono, Toyonaka, all of Japan, assignors to Nihon Nohyaku Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1981, Ser. No. 252,004

Int. Cl.³ C07D *339/06*

U.S. Cl. 549—39 **6 Claims**

1. A process for producing 1,3-dithiol-2-ylidene malonic acid dialkyl esters which is characterized by reacting a dialkyloxycarbonylketene dimercaptide with a trihalogenoethane in the presence of a base.

4,327,224

α[(ALKYLAMINO)ALKYL]-4-HYDROXY-3-(ALKYLTHIO)BENZENEMETHANOLS, DERIVATIVES THEREOF AND INTERMEDIATES THEREFOR

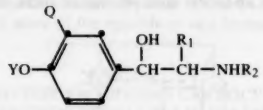
Sydney Archer, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Jun. 25, 1976, Ser. No. 700,036

Int. Cl.³ C07C *69/14*

U.S. Cl. 560—142 **14 Claims**

1. A compound having in the free base form the formula:



wherein:

R_1 is hydrogen, methyl or ethyl;

R_2 is lower alkyl;

Q is lower alkylthio or lower alkylsulfinyl; and

Y is hydrogen, lower alkanoyl, benzoyl or benzoyl substituted with from 1 to 2 methyl groups;

or an acid-addition salt thereof.

4,327,225

PROCESS FOR PRODUCING 2-PENTENOIC ESTER

Nobuo Isogai; Motoyuki Hosokawa; Takashi Okawa, and Natsuko Wakui, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

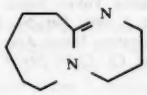
Filed Oct. 9, 1980, Ser. No. 195,524

Claims priority, application Japan, Oct. 12, 1979, 54/131377

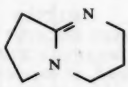
Int. Cl.³ C07C *67/333*

U.S. Cl. 560—205 **5 Claims**

1. A process for producing a 2-pentenoic ester which comprises isomerizing the corresponding 3-pentenoic ester in the presence of dicyclized amidine selected from the group consisting of 1,8-diazabicyclo(5,4,0)undecene-7, represented by the formula



and 1,5-diazabicyclo(4,3,0)nonene-5 represented by the formula



and mixtures thereof.

4,327,226

PROCESS AND APPARATUS FOR PRODUCING AROMATIC DICARBOXYLIC ACIDS

Motoo Shigeyasu, and Takehiko Kitamura, both of Matsuyama, Japan, assignors to Matsuyama Petrochemicals Inc., Osaka, Japan

Division of Ser. No. 958,918, Nov. 8, 1978, abandoned, which is a continuation of Ser. No. 771,493, Feb. 24, 1977, Pat. No. 4,159,493. This application Jul. 23, 1980, Ser. No. 171,510

Claims priority, application Japan, Feb. 24, 1976, 51/18422; Feb. 24, 1976, 51/18423

Int. Cl.³ C07C *51/16*

U.S. Cl. 562—416 **31 Claims**

1. In a process for producing an aromatic dicarboxylic acid by liquid-phase oxidation of a benzene derivative with molecular oxygen in a lower aliphatic carboxylic acid as a solvent in the presence of an oxidation catalyst, the improvement comprising feeding a starting material liquid comprising said benzene derivative or a solution of said benzene derivative in said solvent in a uniformly dispersed state into the liquid-phase reaction system by passing said starting material liquid through a porous material causing the pressure of the starting material liquid just after passing through said porous material to drop more than about 1 kg/m² in relation to the pressure of the starting material liquid just before passing through said porous material.

4,327,227

PROCESS FOR PRODUCING PURIFIED BROMINATED AROMATIC COMPOUNDS

James T. Ayres; David L. McAllister, both of El Dorado, Ark., and John L. Sands, West Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 122,860, Feb. 20, 1980, abandoned, which is a continuation of Ser. No. 926,934, Jul. 21, 1978, abandoned, which is a continuation of Ser. No. 784,235, Apr. 4, 1977, abandoned. This application Jul. 8, 1980, Ser. No. 163,957

Int. Cl.³ C07C *41/22*

U.S. Cl. 568—639 **16 Claims**

1. A process for purifying crude solid decabromodiphenyl ether containing occluded bromine and hydrogen bromide as impurities comprising the steps of:

grinding the crude decabromodiphenyl ether to provide particles predominantly less than about 20 microns in diameter and substantially entirely less than about 100 microns in diameter; and

subsequently heating the crude ground decabromodiphenyl ether at a temperature of about 150°–300° C. for a time sufficient to effect substantial removal of the impurities therefrom.

4,327,228

3-NITRO-1-PHENYL-1-(M-CHLOROPHENYL)-PROPAN-2-OL.

Paul Smith, Hoddesdon, England, assignor to Beecham Group Limited, England

Filed Jun. 3, 1980, Ser. No. 156,189

Claims priority, application United Kingdom, Jun. 14, 1979, 20746/79

Int. Cl.³ C07C *4/00*

U.S. Cl. 568—705 **1 Claim**

1. 3-Nitro-1-phenyl-1-(m-chlorophenyl)propan-2-ol.

4,327,229

RECOVERY OF BISPHENOL-A VALUES

Ashok K. Mendiratta, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 19, 1981, Ser. No. 226,271

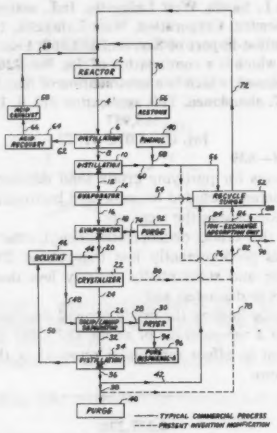
Int. Cl.³ C07C *39/16, 37/82*

U.S. Cl. 568—728 **9 Claims**

1. In the process of making bisphenol-A comprising reacting acetone and phenol in the presence of mineral acid catalyst to produce a mixture of bisphenol-A, and phenol-acetone condensation by-products having color bodies therein, separating the mixture of bisphenol-A and condensation by-products into crude bisphenol-A, lower boiling condensation reaction by-products and higher-boiling condensation by-products having most of the color bodies therein by distillation/evaporation; crystallizing the crude bisphenol-A in the presence of an organic solvent to produce high purity bisphenol-A and a solvent liquor containing phenol-acetone condensation by-products having color bodies therein; separating the high purity bisphenol-A from the solvent liquor; distilling the solvent liquor to produce organic solvent for recycling and residual liquor containing phenol-acetone condensation reaction by-products having color bodies therein including isomeric impurities, purging from the system the higher-boiling condensation reaction by-products and part of the residual liquor, to maintain bisphenol-A product, color quality and to avoid build-up of by-products in the system; and recycling the balance of residual liquor; the improvement comprising:

(a) adding phenol to part (e.g., up to 50%) of the higher-boiling condensation by-products having color bodies therein obtained from the separation of the mixture of the bis-

phenol-A and condensation by-products by distillation-/evaporation into crude bisphenol-A, lower boiling condensation reaction by-products and a tarry residue containing higher-boiling condensation by-products having color bodies therein, and passing the resulting liquor through cation exchange resin to remove color bodies and thereby produce a phenol liquor suitable for recycling; and



(b) adding phenol to part of the purged residual liquor, (e.g., up to 75%) containing phenol-acetone condensation by-products having color bodies therein obtained from the purge stream of higher-boiling condensation reaction by-products and residual liquor after distilling the solvent liquor to produce organic solvent for recycling; and passing the resulting liquor through cation exchange resin to remove color bodies and thereby produce a phenol liquor suitable for recycling.

4,327,230

METHOD FOR THE CONTINUOUS PREPARATION OF ALCOHOLATES

Otto Ackermann; Hans Leuck; Günther Meyer, all of Troisdorf-Sieglar, and Gerhard Schmeling, Brühl, all of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

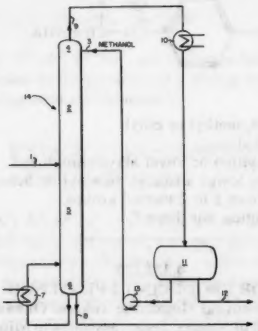
Continuation of Ser. No. 913,416, Jun. 7, 1978, abandoned. This application Mar. 10, 1980, Ser. No. 128,421

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1977, 2726491

Int. Cl.[3] **C07C** *29/70, 35/04, 35/06, 35/08*

U.S. Cl. 568—851 **17 Claims**

1. A process for the continuous production of an alkali metal alcoholate of a higher alcohol which comprises continuously introducing an excess of a higher alcohol selected from the group consisting of ethanol, n-propanol, n-butanol, 2-methylpropanol-(1), n-pentanol, 2-methylbutanol-(4), 2-methylbutanol-(1), 2,2-dimethylpropanol-(1), n-hexanol, 2-ethylhexanol-(1), isopropanol, butanol-(2), pentanol-(2), pentanol-(3), 2-methylbutanol-(3), 2-methylpropanol-(2), 2-methylbutanol-(2), cyclopropanol, cyclobutanol, cyclopentanol and cyclohexanol into a reaction vessel provided with different reaction zones, superposed with at least one rectification zone, continuously introducing an alkali metal alcoholate of a lower alcohol selected from the group consisting of methanol and ethanol into said reaction vessel and continuously and simultaneously distilling over and removing from said said reaction vessel a composition which is substantially pure lower alcohol and removing from said reaction vessel a solution of alkali metal alcoholate of higher alcohol in the higher alcohol and constantly adding lower alcohol to said rectification zone, the reflux rate of the lower alcohol amounting in the rectification zone from 6 to up to 200 mols per mol of alkali metal alcoholate of lower alcohol introduced into said reaction vessel provided that when the lower alcohol is ethanol, the higher alcohol is not ethanol.



4,327,231

PROCESS FOR THE PRODUCTION OF TERTIARY ALCOHOLS

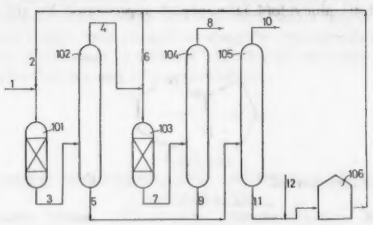
Yoshiharu Okumura, Kawagoe; Hiroshi Furukawa, and Katsumi Kaneko, both of Ooi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1980, Ser. No. 126,822

Claims priority, application Japan, Apr. 27, 1979, 54-51463

Int. Cl.[3] **C07C** *29/04*

U.S. Cl. 568—899 **9 Claims**



1. In a process for the production of tertiary alcohols by causing an isoolefin or a hydrocarbon mixture containing an isoolefin to react with water in the presence of a solid catalyst, the improvement which comprises carrying out the reaction in the presence of 5 to 800 parts by weight per 100 parts by weight of water of a neo-type polyhydric alcohol or derivative thereof.

4,327,232

CYCLOPROPANE RING-CONTAINING COMPOUNDS AS INHIBITOR COMPONENTS IN METHYLCHLOROFORM

Alvetta Pryor, Houston, and Nobuyuki Ishibe, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 19, 1981, Ser. No. 235,883

Int. Cl.[3] **C07C** *17/42*

U.S. Cl. 570—108 **6 Claims**

1. In a stabilizer formulation useful in stabilizing methylchloroform used in vapor degreasing wherein said formulation contains an alkylene oxide as a component of said stabilizer, the

improvement which comprises employing a bicyclic, a tricyclic or a quadricyclic compound which contains a fused cyclopropane ring in place of the epoxide in said formulation.

4,327,233

METHOD FOR PRODUCING CARBOCYCLIC COMPOUNDS FROM CYCLIC SULFIDE

Richard I. Martinez, Gaithersburg, and John T. Herron, Darnestown, both of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Mar. 26, 1981, Ser. No. 247,684
Int. Cl.³ C07C *1/00*
U.S. Cl. 585—357 **18 Claims**

1. A method for producing a carbocyclic compound, which comprises contacting an organic compound containing a 4–8 membered cyclic sulfide moiety and having the formula

wherein A is a moiety containing a divalent 3–7 carbon alkylene bridge whose two termini are joined to a sulfur atom to form said cyclic sulfide moiety, with ozone, in the vapor phase, and recovering from the resultant reaction mixture a product containing a 3–7 membered carbocyclic ring formed by extrusion of said sulfur atom and joining of said two termini through a carbon-carbon single bond; wherein substantially no non-sulfur-containing compound having olefinic unsaturation instead of said 3–7 membered carbocyclic ring is produced in said reaction mixture.

15. A method of producing cyclobutane, which comprises contacting thiolane with ozone, in the vapor phase, at a temperature of from 0° to 125° C., and recovering the resultant cyclobutane; wherein said ozone is supplied as a mixture of from 1 to 10% ozone in oxygen, and the total initial pressure of thiolane and said ozone-oxygen mixture is from 0.1 to 100 Torr.; and wherein substantially no ethylene is produced.

4,327,234

HYDROGENATION PROCESS USING SUPPORTED NICKEL CATALYST

Gerhard P. Nowack, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 5, 1980, Ser. No. 213,424
Int. Cl.³ C08L *7/00*
U.S. Cl. 585—267 **12 Claims**

1. A method for the hydrogenation of an unsaturated hydrocarbon comprising contacting the unsaturated hydrocarbon with hydrogen under suitable hydrogenation conditions in the presence of a catalyst comprising nickel on a calcium phosphate support, wherein an effective amount of said nickel is free of chemical combination with phosphorus.

4,327,235

METHOD FOR PREFERENTIAL HYDROGENATION OF TERMINAL METHYLENE GROUP IN COMPOUND POSSESSING TERMINAL METHYLENE GROUP

Yukimichi Nakao, and Shoei Fujishige, both of Ibaragi, Japan, assignors to Agency of Industrial Science & Technology and Ministry of Inernational Trade & Industry, both of Tokyo, Japan

Filed Dec. 16, 1980, Ser. No. 217,189
Claims priority, application Japan, Jun. 30, 1980, 55/88666
Int. Cl.³ C07C *7/10*
U.S. Cl. 585—270 **4 Claims**

1. A method for preferential hydrogenation of a methylene group in an organic compound containing a group represented by the general formula:

wherein, R is one member selected from the group consisting of alkyl groups and aryl groups and C to which R and CH_2 are attached is a tertiary carbon atom, which method comprises exposing the organic compound to hydrogen in an alcohol solution containing a nickel boride colloid.

4,327,236

HYDROCARBON-CONVERSION CATALYST AND ITS METHOD OF PREPARATION

Marvin R. Klotz, Batavia, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 54,958, Jul. 3, 1979, Pat. No. 4,268,420, which is a continuation-in-part of Ser. No. 897,360, Apr. 18, 1978, Pat. No. 4,269,813, which is a continuation-in-part of Ser. No. 733,267, Oct. 18, 1976, abandoned, and Ser. No. 819,974, Jul. 28, 1977, abandoned, and Ser. No. 836,403, Sep. 26, 1977, abandoned. This application Aug. 29, 1980, Ser. No. 182,796
Int. Cl.³ C10G *47/04, 35/06*
U.S. Cl. 585—481 **23 Claims**

1. A process for the conversion of a hydrocarbon stream, which process comprises contacting said stream at conversion conditions with a catalytic composition comprising a crystalline borosilicate and a porous refractory inorganic oxide, said borosilicate and said inorganic oxide having been intimately admixed with one another, said borosilicate comprising a molecular sieve material providing an X-ray diffraction pattern comprising the following X-ray diffraction lines and assigned strengths:

d(A)	Assigned Strength
11.2 ± 0.2	W–VS
10.0 ± 0.2	W–MS
5.97 ± 0.07	W–M
3.82 ± 0.05	VS
3.70 ± 0.05	MS
3.62 ± 0.05	M–MS
2.97 ± 0.02	W–M
1.99 ± 0.02	VW–M

and having the following composition in terms of mole ratios of oxides:

$$0.9\pm0.2M_{2/n}O:B_2O_3:YSiO_2:ZH_2O$$

wherein M is at least one cation having a valence of n, Y is between 4 and about 600, and Z is between 0 and about 160.

4,327,237

PROCESS FOR PREPARING VISCOSITY INDEX IMPROVERS FOR LUBRICATING OILS BY CRACKING SYNTHETIC RUBBERS IN THE LIQUID PHASE

Luigi Imparato; Giampaolo Gerbaz, both of Milan, and Enrico Betta, Pero, all of Italy, assignors to Agip Petroli, S.p.A., Rome, Italy

Filed Jun. 4, 1980, Ser. No. 156,428
Claims priority, application Italy, Sep. 10, 1979, 25567 A/79
Int. Cl.³ C07C *4/04*
U.S. Cl. 585—648 **4 Claims**

1. A process for the preparation of viscosity index improvers for lubricating oils, which process comprises thermally cracking, at a temperature of between 250° C. and 350° C., in an inert atmosphere, under vigorous stirring, a solution of a mono-olefin copolymer in mineral oil, said solution containing of from 0.01 to 0.5 weight percent, based on the weight of the solution, of free radical scavengers.

4,327,238

DEHYDROGENATION OF ORGANIC COMPOUNDS WITH A PROMOTED ZINC TITANATE CATALYST

Alan D. Eastman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 28, 1980, Ser. No. 125,436
Int. Cl.[3] C07C *5/32, 5/333*
U.S. Cl. 585—661 14 Claims

1. A process for the catalytic dehydrogenation of at least one dehydrogenatable organic compound which has at least one

grouping comprising the step of contacting said at least one dehydrogenatable organic compound, under suitable dehydrogenation conditions in the substantial absence of free oxygen with a catalyst composition comprising zinc, titanium, and at least one promoter selected from the group consisting of chromium, antimony, bismuth, the lanthanides, the actinides, oxides thereof, and compounds convertible to the oxides thereof, wherein the concentration by weight of said at least one promoter in said catalyst composition is less than the total concentration by weight of said zinc and said titanium in said catalyst composition wherein said zinc and said titanium are present in said catalyst composition in the form of zinc titanate which is prepared by calcining a mixture of zinc oxide and titanium dioxide in the presence of free oxygen at a temperature in the range of about 650° C. to about 1050° C.

4,327,239

METHOD FOR PRODUCING HYDROCARBONS AND OXYGEN FROM CARBON DIOXIDE AND WATER

William H. Dorrance, Ann Arbor, Mich., assignor to Organization Control Services, Inc., Ann Arbor, Mich.

Filed Feb. 26, 1981, Ser. No. 238,487
Int. Cl.[3] C07C *1/12*
U.S. Cl. 585—733 10 Claims

1. A method for producing hydrocarbons and oxygen from water and carbon dioxide comprising:

flowing water as steam into contact with a hydrated zeolite contained in a first reaction vessel, said zeolite that possesses thermal stability to above 500° C. and having pores large enough to pass molecules of up to 4 angstroms kinetic diameter, and containing metal cation in a high oxidation state having a standard reduction potential less positive than 3 volts, the temperature in said first reaction vessel being above 500° C. and the pressure in said reactor vessel being above 14.7 psia and sufficiently high to prevent dehydration of said zeolite, thereby to cause a reaction of said water with said zeolite which generates oxygen and which converts said zeolite to a solid product containing substantially the same number of moles of water of hydration as in said zeolite prior to said reaction and containing the metal cation in a lower oxidation state;

withdrawing oxygen from said first reaction vessel;

withdrawing said solid reaction product from said first reaction vessel and passing it through a heat exchanger and then into a second reaction vessel, the pressure in said reaction vessel being above 14.7 psia and sufficiently high to prevent dehydration of said solid reaction product, flowing carbon dioxide into contact with said solid reaction product, the temperature in said second reaction vessel being below 400° C. and being at least 200° C. less than the temperature in said first reaction vessel, thereby to cause a reaction of said carbon dioxide with said solid reaction product which produces a mixture of hydrocarbons and water and which converts said solid reaction product to said zeolite containing the metal cation in its high oxidation state;

withdrawing the mixture of hydrocarbons and water from said second reaction vessel; and

withdrawing the zeolite from said second reaction vessel and passing it through said heat exchanger into said first reaction vessel, said zeolite from the second reaction vessel being heated in said heat exchanger from said solid reactant product passing through said heat exchanger from said first reaction vessel.

4,327,240

HYDROCARBON ISOMERIZATION CATALYST AND PROCESS

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

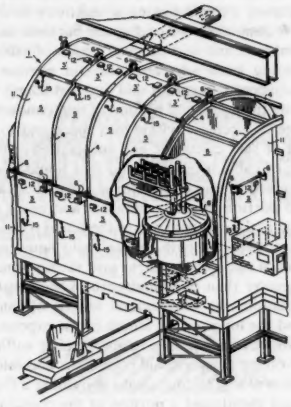
Continuation-in-part of Ser. No. 68,278, Aug. 20, 1979, Pat. No. 4,256,566, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Dec. 3, 1980, Ser. No. 212,642
The portion of the term of this patent subsequent to Mar. 17, 1998, has been disclaimed.
Int. Cl.[3] C07C *5/13*
U.S. Cl. 585—744 12 Claims

1. A process for isomerizing saturated hydrocarbons which comprises contacting said hydrocarbon at isomerization conditions with a catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state during the incorporation and pyrolysis of the rhenium carbonyl component, of a tin component, and of a halogen component.

4,327,241
EXPLOSION VENTING MEANS FOR METALLURGICAL FURNACE

Richard F. Obenchain, 3340 Comanche Rd., Pittsburgh, Allegheny County, Pa. 15241

Filed Oct. 22, 1980, Ser. No. 199,617
Int. Cl.³ F27D *23/00*
U.S. Cl. 373—9 **11 Claims**



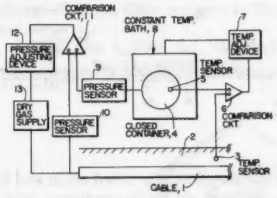
1. In a metallurgical furnace station enclosure wherein a housing is provided formed from frame members which support a series of panels, the housing enclosing the furnace during charging, melting, refining and tapping, the improvement wherein:

a plurality of said panels are constructed as explosion venting panels adapted for restrictive movement relative to the frame members of the housing, said venting panels movable from a closed position during normal operation of the furnace to a restricted open position upon explosive forces being exerted from within the enclosure.

4,327,242
METHOD FOR CONTROLLING GAS PRESSURE SEALED IN COAXIAL COMMUNICATION CABLE

Yasunori Saito, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 18, 1980, Ser. No. 131,338
Claims priority, application Japan, Apr. 3, 1979, 54-40629; Jul. 13, 1979, 54-89681
Int. Cl.³ H02G *1/00*; H01B *11/18*; H01P *3/06*
U.S. Cl. 174—11 R **6 Claims**



1. A method for stabilizing the electrical length of a coaxial communication cable having a gas sealed in the electrically insulated space between the inner and outer conductors of the coaxial cable comprising: maintaining constant the density of said gas by controlling the pressure of said gas so as to satisfy the following equation in accordance with variations in the temperature of said coaxial cable:

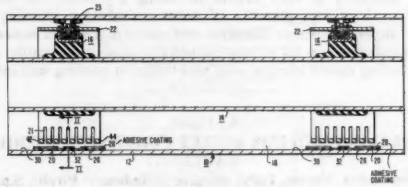
$$P(T) = P(T_o) \cdot \left(1 + \frac{T - T_o}{273 + (T - T_o)}\right),$$

wherein T_o is a predetermined reference temperature, P(T) is said pressure of said gas, T is said temperature, and $P(T_o)$ is the absolute pressure of said gas sealed in said coaxial cable at said reference temperature, thereby maintaining constant the dielectric constant of the sealed gas regardless of temperature changes and, thus, stabilizing the electrical length of the cable.

4,327,243
GAS INSULATED TRANSMISSION LINE WITH ADHESIVE PARTICLE TRAP CARRIER

Melvyn D. Hopkins, North Grafton, Mass., and Philip C. Bolin, Wilkins, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 2, 1981, Ser. No. 222,115
Int. Cl.³ H01B *9/06, 9/04*; H02G *5/06*
U.S. Cl. 174—14 R **12 Claims**



1. A gas insulated transmission line comprising:

a cylindrical outer sheath at low electric potential;

an inner conductor disposed within said outer sheath;

an insulating gas disposed within said outer sheath;

an insulating support insulatably supporting said inner conductor within said outer sheath;

a cylindrical, apertured particle trapping ring disposed within, and spaced-apart from said outer sheath;

a circumferentially-extending flexible insulating sheet secured to said particle trapping ring and disposed on the interior surface of said outer sheath, said sheet having an adhesive coating disposed thereon facing said ring;

a circumferentially-extending insulating leaf spring, preformed on the radius of curvature of said outer sheath, secured to said ring and disposed intermediate said insulating sheet and said ring, said leaf spring contacting and loading said insulating sheet to hold said insulating sheet on the interior surface of said outer sheath; and

a stiffener spring secured to said ring intermediate said ring and said leaf spring, said stiffener spring preloading said leaf spring and said insulating sheet outwardly away from said ring and toward said outer sheath.

4,327,244
SUPERCONDUCTIVE CABLE

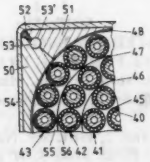
Imre Horvath, Rümlang, and Kurt Kwasnitza, Glattbrugg, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 1, 1980, Ser. No. 117,634
Claims priority, application Switzerland, Feb. 9, 1979, 1279/79
Int. Cl.³ H01B *12/00, 7/34*
U.S. Cl. 174—15 S **14 Claims**

1. An electrical superconductive cable, comprising:

a plurality of bundles of wire strands, said plurality of bundles of wire strands being disposed such that said cable is divided by said bundles into one of a plurality of concentric annular sections and a plurality of radial sections, each of said plurality of bundles of wire strands including a

plurality of wire strands, each of said plurality of wire strands being covered by a sheath, each of said plurality of bundles of wire strands being covered by a sheath, each of said sheaths being formed from a highly electrically resistive, non-magnetic, heat conductive material, each of said



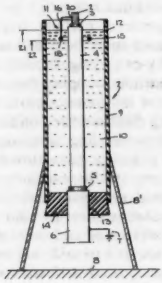
plurality of wire strands including a plurality of wires, each of said plurality of wires including a plurality of superconductive filaments embedded in a matrix material; housing means for at least partially enclosing said cable; and cooling means integral with said cable for cooling said cable.

4,327,245

SEALING END FOR DIRECT CURRENT ELECTRIC CABLES

Piero Metra, Varese, Italy, assignor to Industrie Pirelli, S.p.A., Milan, Italy

Filed Jun. 13, 1980, Ser. No. 159,121
Claims priority, application Italy, Jun. 21, 1979, 23752 A/79
Int. Cl.³ H02G *15/064*
U.S. Cl. 174—19 **17 Claims**



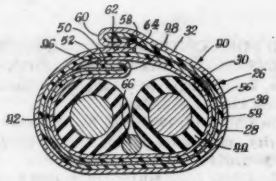
1. A sealing end installation on a direct current cable, said cable comprising a conductor, a sheath around said conductor and layers of material, including a layer of semiconductive material and a layer of cable insulation, intermediate said sheath and said conductor, said layer of insulation having a resistivity of at least 10^{10} ohm-meter, said layers and said sheath being removed from around an end portion of said conductor to provide an end portion of said conductor from which the layers and said sheath have been removed and the sheath and all the layers of the cable outwardly of a length of said cable insulation which is adjacent said end portion of said conductor being removed from around said length of said cable insulation to provide an end of said sheath spaced longitudinally of said cable from said end portion of said conductor and to provide an exposed length of said cable insulation which extends substantially from said end portion of said conductor to said end of said sheath, a hollow container of insulating material which retains liquid disposed around said exposed length of cable insulation, said container having its inner wall spaced outwardly from said exposed length of cable insulation to provide a space between said exposed length of cable insulation and said inner wall for receiving a liquid and said container extending from adjacent said end portion of said conductor to adjacent the end of said exposed length of said cable insulation remote from said end portion of said conductor and having a length longitudinally of said conductor sufficient to withstand the voltage between said conductor and said sheath without breakdown, a liquid having a resistivity in the range from 10^8 to 10^6 ohm-meter in said space between said inner wall of said container and said exposed length of cable insulation and extending from adjacent said end portion of said conductor to adjacent said end of said exposed length of cable insulation remote from said end portion of said conductor, said liquid being free to circulate within said space and to contact said inner wall of said container and substantially all of said exposed length of cable insulation, and said liquid being conductively connected to said conductor at the end of the liquid nearer said end portion of said conductor and being conductively connected at the opposite end of the liquid to said sheath to provide a direct current path through said liquid and from said end portion of said conductor to said sheath which has a resistivity no greater than one-hundredth of the resistivity of said cable insulation, the longitudinal length of said direct current path and the longitudinal length of the exposed length of cable insulation within said container being sufficient to withstand the voltage between said conductor and said sheath without breakdown, and sealing means providing a fluid-tight seal between said sheath and a portion of the container adjacent said end of said exposed length of cable insulation remote from said end portion of said conductor.

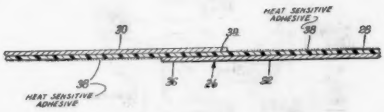
4,327,246

ELECTRIC CABLES WITH IMPROVED SHIELDING MEMBERS

John W. Kincaid, Batavia, Ill., assignor to Belden Corporation, Geneva, Ill.

Filed Feb. 19, 1980, Ser. No. 122,296
Int. Cl.³ H01B *11/06, 9/02*
U.S. Cl. 174—36 **19 Claims**





1. A shielding member helically coiled about and for shielding at least one insulated electrical conductor, said helically coiled shielding member comprising: an elongated ribbon of insulating material having two opposite sides and two parallel edges; a pair of elongated metallic foil strips arranged in a parallel relationship with the ribbon, each strip having two opposite sides and two parallel edges, with a respective side of each strip bonded to a respective one of the opposite sides of the ribbon, one of the edges of one of the foil strips being substantially coterminus with one edge of the elongated rib-

bon, and one of the edges of the other of the foil strips being substantially coterminus with the other edge of the elongated ribbon, the width of each of the foil strips being approximately one half the width of the ribbon, and each of the other edges of the foil strips slightly overlapping one another, said ribbon being helically wound about said at least one insulated electrical conductor with each of said foil strips surrounding and forming a shielding envelope for at least one insulated electrical conductor; and a layer of adhesive on a portion of the exposed surface of the ribbon and extending along the length of the ribbon.

4,327,247

PRINTED WIRING BOARD

Kazuyuki Mituhashi, Ohmihachiman; Kunio Matumoto, Hikone; Haruo Shirai, and Yoshikatu Tanaka, both of Kyoto, all of Japan, assignors to Shin-Kobe Electric Machinery Co., Ltd., Tokyo and Shirai Eenshi Kogyo Co., Ltd., Kyoto, both of, Japan

Continuation-in-part of Ser. No. 947,480, Oct. 2, 1978, abandoned. This application Nov. 19, 1979, Ser. No. 95,323

Int. Cl.³ H05K *1/14*

U.S. Cl. 174—68.5 **7 Claims**

1. A printed wiring board having first and second electrically conductive circuit layers on an insulating laminate, characterized in that said insulating laminate comprises a first insulating layer having a thickness of 0.01 to 0.5 mm and a second insulating layer attached to said first insulating layer so as to have a desired thickness, first and second metal foil circuit layers being provided on opposite sides of said first insulating layer, a surface defining an aperture through only said first insulating layer, a hollow tubular conductor in said aperture electrically interconnecting at least a part of said first metal foil circuit layer with at least a part of said second metal foil circuit layer, an insulator within said hollow tubular conductor, device mounting through holes through both of said insulating layers and separate from said hollow tubular conductor, and insulating material integral with said second insulating layer and completely filling said central aperture of said hollow tubular conductor to inhibit breakage of the conductor material of said hollow tubular conductor.

4,327,248

SHIELDED ELECTRICAL CABLE

Larry J. Campbell, Kent, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 6, 1980, Ser. No. 194,317

Int. Cl.³ H01B *7/18*

U.S. Cl. 174—107 **13 Claims**

1. A shielded electrical cable having improved flexibility and resistance to wrinkling on bending, said cable comprising:

(a) at least one insulated electrical conductor;

(b) a flexible metal tape disposed in emcompassing relationship in the form of a shield about the electrical conductor;

(c) a coating of a copolymer of ethylene and a monomer having a reactive carboxyl group disposed on at least the outer surface of the shield;

(d) a covering disposed in emcompassing relationship about the coated shield, said covering made from a flexible or semi-rigid non-olefinic polymeric material; and

(e) an adhesive disposed intermediate the shield coating and the covering and adapted to bond them together.

4,327,249

DIRECT CURRENT TELEGRAPHY SYSTEMS

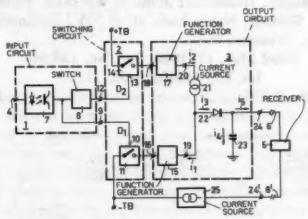
Gerrit Rademaker, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 16, 1980, Ser. No. 150,385

Claims priority, application Netherlands, Jun. 5, 1979, 7904375

Int. Cl.³ H04B *1/62;* **H03K** *13/02;* **H04L** *15/00*

U.S. Cl. 178—3 **6 Claims**



1. An electronic transmitter for direct current telegraphy systems, in which transmitter binary information signals are converted into line currents for transmission over a telegraph line, and which transmitter comprises; an input circuit for generating command signals from the information signals, a telegraph voltage source having a first terminal and a second terminal, a switching circuit controlled by the command signals for connecting one of the two terminals of the telegraph voltage source to the telegraph line, and an output circuit coupled to the switching circuit and the telegraph line and comprising a current source for applying line current to the telegraph line, characterized in that the output circuit further comprises a function generator device which is coupled to the switching circuit and to the current source, the value of the line current supplied by the current source varying in response to level transitions in the command signals, in accordance with a power of e having a positive exponent.

4,327,250

DYNAMIC SPEAKER EQUALIZER

Daniel R. von Recklinghausen, Arlington, Mass., assignor to Electro Audio Dynamics Inc., Great Neck, N.Y.

Filed May 3, 1979, Ser. No. 35,496

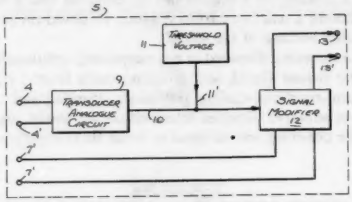
Int. Cl.³ H04R *3/00*

U.S. Cl. 179—1 F **8 Claims**

1. Means for protecting an electro-dynamic transducer comprising the combination of sensing means for forming a control signal representative of an operation characteristic of the transducer, signal modifying means coupled in the transducer driving signal input including means for modifying the transducer input signal in accordance with the said control signal,

said sensing means comprising an analog circuit forming a signal based upon the operational condition of the driven transducer and including integrator means coupled to a differential amplifier and means applying a predetermined threshold voltage to the amplifier, and

said signal modifying means including a high pass filter coupled to the driving signal and a FET coupled between



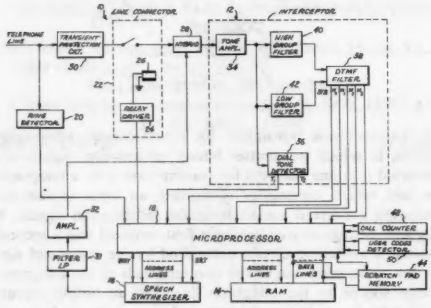
the high pass filter and the output of the said differential amplifier.

4,327,251

AUTOMATIC TELEPHONE DIRECTORY MESSAGE SYSTEM

Joseph Fomenko, Rochester; John A. Kuecken, Pittsford, and James J. Sloboda, North Rose, all of N.Y., assignors to Radionics Inc., Webster, N.Y.

Filed Mar. 17, 1980, Ser. No. 130,948
Int. Cl.³ H04M *1/05, 11/10*
U.S. Cl. 179—1 SM **17 Claims**



1. A telephone directory message system which comprises means for detecting numbers representing user codes and messages to be transmitted to callers or users which are entered on a telephone line, memory means for storing user code numbers and accompanying message numbers and having a plurality of different locations each for a separate user code number and its accompanying message number, means for writing each of said user code numbers and said message numbers which accompany them into said different locations in said memory, speech synthesizer means having a vocabulary of words of speech corresponding to said message numbers, and means responsive to said user code numbers for operating said synthesizer in accordance with the message numbers stored in the same location with said user code numbers for transmitting signals representing said speech words on said telephone lines.

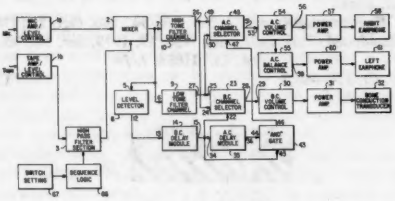
4,327,252

APPARATUS FOR CONDITIONING HEARING

Alfred A. A. A. Tomatis, 68, Boulevard de Courcelles, 75017 Paris, France

Filed Apr. 18, 1980, Ser. No. 141,648
Claims priority, application Canada, Feb. 8, 1980, 345300
Int. Cl.³ H04R *3/00*
U.S. Cl. 179—1 N **20 Claims**

1. Apparatus for conditioning the hearing of a patient comprising an input stage providing audio frequency electrical signals derived from acoustic signals, means connected to an output of the input stage for determining the envelope level of the audio frequency electrical signals, means for comparing the envelope level with a predetermined threshold level and deriving a first logic signal when the envelope level is below the predetermined threshold level and a second logic signal when the envelope level is above the predetermined threshold level, two channels connected in parallel to the output of the input stage, the first channel containing first filter means defining a first response curve over the audio frequency spectrum and the second channel containing second filter means defining a second response curve over the audio frequency spectrum, first channel selector means connected between, the two channels and, a first output stage, the first output stage comprising an electromechanical vibrator for applying vibrations to the patient's skull, the first channel selector means being operable under control of the envelope level comparing means to con-



nect a predetermined one of the two channels to the first output stage when the first logic signal is derived and to connect the other channel to the first output stage when the second logic signal is derived, second channel selector means connected between, the two channels and, on the other hand, a second output stage, the second output stage comprising speaker means for applying acoustic air waves to the patient's ear, first time delay means connected to receive an output of the envelope level comparing means thereby to derive from the logic signals applied to the first channel selector means delayed logic signals which are time delayed by a predetermined amount with respect to the logic signals applied to the first channel selector means, the second channel selector means being operable under control of the first time delay means to connect the predetermined one of the two channels to the second output stage when the delayed first logic condition is obtained and to connect the other channel to the second output stage when the delayed second logic condition is obtained.

4,327,253

CIRCUIT ARRANGEMENT FOR CONSECUTIVELY MONITORING OPERATING CONDITIONS OF DIRECT CURRENT DEVICES

Robert Lechner, Otterfing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 8, 1980, Ser. No. 184,761
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1979, 2938981
Int. Cl.³ H04M *3/22*
U.S. Cl. 179—18 FG **6 Claims**

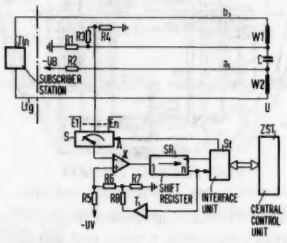
1. Circuit arrangement for monitoring operating conditions of a group of direct current devices, said operating conditions represented by different potentials occurring at a sampling point of each of said direct current devices, said circuit arrangement comprising:

(a) a selector unit having parallel signal inputs, an output and a control input for receiving an address control signal for activating selectively each one of said signal inputs during a monitoring cycle, and each of said signal inputs being connected to the sampling point of a respective one of said direct current devices;

(b) means for generating an address control signal train and having an output connected to said control input of said selector unit;

(c) a comparator having a monitoring signal input, a reference signal input and an output carrying control signals, and said monitoring signal input being connected to the output of said selector unit;

(d) a voltage source for generating a basic reference voltage for comparison to said potentials to be monitored at said sampling points, said voltage source being coupled to said reference signal input of said comparator;



(e) means for buffering said control signals for one monitoring cycle, said buffering means having an input connected to said output of said comparator and an output for supplying said control signals delayed by one monitoring cycle; and

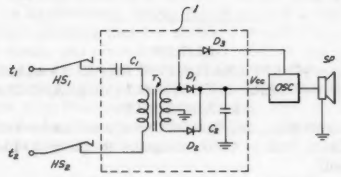
means for rating the delayed control signals and for providing feedback of the rated control signals to said reference signal input of said comparator wherein the rated control signals are superposed on said basic reference voltage for establishing an adjustable reference voltage level dependent on the operating condition of the respective monitored device during the previous monitoring cycle.

4,327,254

RINGER CIRCUIT FOR TELEPHONE

Katsuaki Kumazaki, Tokyo, Japan, assignor to Tandy Corporation, Fort Worth, Tex.

Filed Mar. 10, 1980, Ser. No. 129,164
Claims priority, application Japan, Mar. 8, 1979, 54-28661[U]
Int. Cl.³ H04M *1/00*
U.S. Cl. 179—84 T **4 Claims**



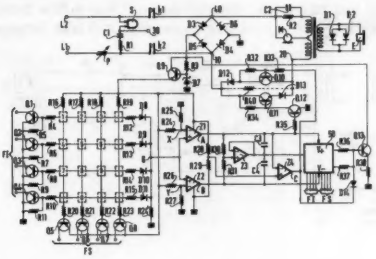
1. A ringer circuit for a telephone, comprising: a transformer having its primary winding connected through hook-switches with the circuit of the telephone; a DC current blocking capacitor connected in series with the primary winding of said transformer; a rectifying circuit for rectifying the secondary voltage of said transformer; an oscillator for providing an oscillating output in response to the rectified output of said rectifying circuit; a sound generator for generating sounds in response to the oscillating output of said oscillator; and a diode operatively connected between the transformer and the oscillator so that the secondary voltage of said transformer is half-wave rectified to generate a trigger voltage which is provided to the oscillator, so that the oscillating output of the oscillator has an interrupted waveform applied to the sound generator.

4,327,255

KEYPAD CALLER FOR A TELEPHONE SET

Jacky Suszylo, Bagneux, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Nov. 18, 1980, Ser. No. 208,102
Claims priority, application France, Nov. 23, 1979, 79 28900
Int. Cl.³ H04M *1/50*
U.S. Cl. 179—90 K **1 Claim**



1. In a keypad caller for an automatic telephone set including a keypad with at least ten keys, each suitable for putting one column out of four in contact with one row out of four, the columns being supplied from telephone line voltage via a fullwave rectifier bridge and a voltage regulator, a ringing circuit of the set being upstream from said bridge and the microphone and receiver circuits being downstream therefrom, a two-frequency oscillator, said keypad including at one end of each of said rows a transistorized switch for earthing a corresponding resistance of said two-frequency oscillator which emits one of the four lower frequencies and including at the opposite end to the voltage regulator of each of said columns, a transistorized switch for connecting to the low impedance of said regulator a corresponding resistance of said two-frequency oscillator which further emits one of the four higher frequencies, the emission of the group of two frequencies, lower and higher, being made possible only by contact of said key, the improvement comprising:

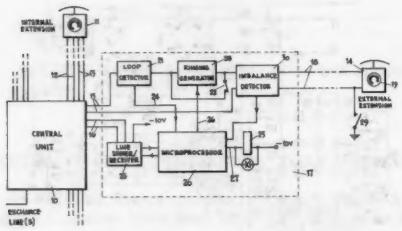
first and second comparators, and wherein the other ends of said rows are connected to the non-inverting inputs of said first and second comparators in parallel whose inverting inputs are connected to said voltage regulator and whose respective outputs constitute a positive and negative voltage supply source of said two frequency oscillator only when a single key is depressed, said first and second comparators both supplying a negative voltage which inhibits said two-frequency oscillator when no key is depressed and both supplying a positive voltage which inhibits the two-frequency oscillator when two keys are depressed simultaneously, and

a third comparator whose negative or inverting input receives the output signal from said first comparator and whose positive or non-inverting input is connected to the common point of two resistances disposed between earth and said voltage regulator, so as to deliver an on/off control voltage depending on whether at least one key is depressed or released to a first transistorized switch disposed to conduct in a first direction between the microphone-receiver and one of the wires of the telephone line and wherein said first comparator delivers an on/off control voltage depending on whether at least one key is depressed or released to a second transistorized switch disposed in parallel with said first switch to conduct in the opposite direction to said first direction, thereby providing an analog inhibiting system for the two-frequency oscillator when two keys are depressed simultaneously.

4,327,256
TELEPHONE SYSTEM

Stephen J. Crooks, North Yorkshire, and Robert A. Stevenson, Durham, both of England, assignors to The General Electric Company Limited, London, England

Filed Apr. 29, 1980, Ser. No. 144,970
Claims priority, application United Kingdom, May 4, 1979, 15676/79
Int. Cl.[3] H04Q 5/20
U.S. Cl. 179—99 R 6 Claims



1. A telephone system of the kind which has at least three telephone instruments and provision for speech connections to be set up automatically by operation of manually operated controls associated with the telephone instruments between any of said instruments, and, selectively, either another of said instruments or a line to a remote exchange, said telephone system comprising

(A) a central unit to which said telephone instruments are connected each by only

(I) a respective first pair of wires for carrying two-way speech signals and

(II) a respective second pair of wires for carrying control and indicating signals between the central unit and the telephone instrument,

(B) the central unit being arranged to operate in response to control signals received over the second pair of wires to connect the first pair of wires to any one of the telephone instruments selectively to either an intercom highway or to an exchange line,

(C) wherein to enable a further telephone instrument to be connected into the system over a single pair of wires and, at least for some facilities of the system, to emulate a telephone instrument having two pairs of connecting wires as aforesaid,

(I) an adaptor unit is connected, adjacent the central unit, between the single pair of wires which are terminated by the further telephone instrument and first and second further pairs of wires which are connected to the central unit,

(II) said first and second further pairs of wires corresponding to the previously mentioned first and second pairs of wires and being arranged respectively to carry speech signals and control signals,

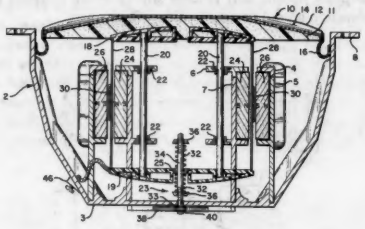
(a) said adaptor unit comprising loop detection means to supply an off-hook control signal to the second further pair of wires in response to the single pair of wires being looped when the further telephone instrument is off-hook and

(b) means to supply a calling signal to the single pair of wires in response to the central unit supplying a signal over the second further pair of wires to signify that the further telephone instrument is to be called.

4,327,257
ALIGNMENT DEVICE FOR ELECTRO-ACOUSTICAL TRANSDUCERS

Leslie H. Schwartz, 23726 Kittridge St., Canoga Park, Calif. 91307

Filed Sep. 10, 1979, Ser. No. 74,144
Int. Cl.[3] H04R 9/06
U.S. Cl. 179—115.5 R 9 Claims



1. A speaker for transforming applied electrical currents into acoustical energy comprising a voice coil assembly having a coil adapted for conducting said applied electrical currents, a diaphragm coupled to said voice coil assembly, magnetic means for providing a magnetic field in an air gap, support means for centering said voice coil assembly in said air gap and for allowing for the axial movement of said voice coil assembly and said diaphragm in response to the magnetic interaction between the magnetic fields produced by said voice coil and said magnetic means, wherein the improvement comprises:

said support means including a rigid top spider assembly disposed between the top of said voice coil assembly, which is rigid, and said diaphragm, a rigid bottom spider assembly affixed to the bottom of said voice coil assembly, at least one rod connecting said top and bottom spider assemblies, and a chassis for supporting said magnetic means and for carrying at least one alignment bushing through which said at least one rod is slideably mounted, and means for returning said voice coil assembly to a predetermined position along the length of said air gap in the absence of applied electrical currents,

wherein said means for returning said voice coil assembly includes at least one spring operatively disposed between said spider-voice coil assembly and said chassis, and

including means for adjusting the tension of said at least one spring.

4,327,258
METHOD AND APPARATUS FOR RAPID EVALUATION OF PARAMETERS AFFECTING VOICEBAND DATA TRANSMISSION

Louis H. Zumbahlen, Jr., Boulder Creek, and Charles Volkland, Santa Clara, both of Calif., assignors to Halcyon, Inc., San Jose, Calif.

Filed Apr. 3, 1980, Ser. No. 136,987
Int. Cl.[3] H04B 3/46
U.S. Cl. 179—175.3 R 34 Claims

1. An apparatus for evaluating impairments affecting voiceband data transmission including phase and amplitude jitter, said apparatus including

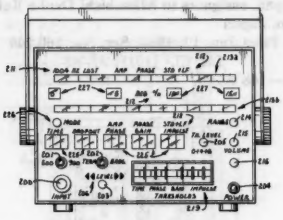
means for receiving a test tone capable of having data affecting impairments thereon,

means for detecting said impairments on said received test tone,

means for producing a digital representation of said impairments,

means for displaying phase jitter in a linear digital display, and

means for simultaneously displaying amplitude jitter in a separate and independent linear digital display, both of



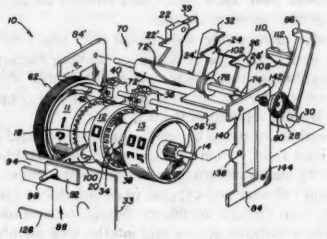
said displaying means being in visual proximity with each other.

4,327,259

TIMING MECHANISM

Maurice E. Schuder, Indianapolis, and Richard W. Stafford, Clayton, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed May 12, 1980, Ser. No. 148,714
Int. Cl.[3] H01H *43/10*
U.S. Cl. 200—38 A **15 Claims**



1. In a timing mechanism wherein coupled drum wheels of a digital interval timer are rotatably set at a predetermined period of time; wherein at least one cam having a notch opening to an outer periphery of said cam is rotatably coupled to at least one of said drum wheels; and wherein an actuator means engages said cam to open and close an electrical switch, said switch opening when said actuator means drops into said notch, an improvement characterized by said actuator means including a pivoting member pivotally mounted with respect to said notch, said pivotally mounted member and said notch provide means such that a resultant force vector between said notch and said pivoting member when they are engaged is in a direction away from said notch, and means whereby said drum wheels may be rotated in either direction after said electrical switch has been opened.

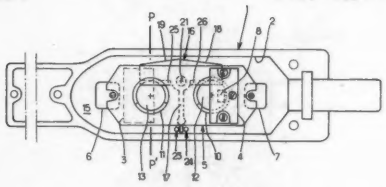
4,327,260

LOCKING DEVICE FOR TWO PUSH BUTTONS

Jean-Claude Vignaud, Angouleme, and Gérard Juéry, Ruelle, both of France, assignors to La Telemecanique Electrique, France

Filed Apr. 16, 1980, Ser. No. 140,920
Claims priority, application France, Apr. 17, 1979, 79 10281
Int. Cl.[3] H01H *9/20, 33/52*
U.S. Cl. 200—50 C **4 Claims**

1. In a control device having: a box with a housing; first and second push buttons slidably mounted in the box and movable between first and second positions along two predetermined parallel directions of actuation, said first and second push buttons having first and second respective operating members; resilient means for normally resetting said push buttons into their first position; support means lodged in said housing; first and second electrical switches respectively mounted on said support means for cooperation with said first and second operating members; a locking device comprising pivot means fixedly mounted within said box between the said electrical switches and said operating members, said pivot means defining a pivoting axis parallel to the said directions of actuation; a T-shaped bolt arranged between said operating members and said switches, said T-shaped bolt having a first arm forming the head of the "T", a second arm perpendicular to the said first arm, said second arm being resiliently deformable, having a free end and forming the upright of the "T"; stop pins fixedly mounted within said box and between which the said free end is engaged, said first arm comprising first and second portions



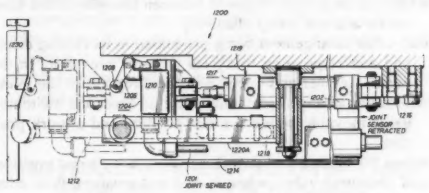
disposed on each side of said pivot means, each said portion comprising a stop surface perpendicular to the said directions of actuation and, on the edge of the said arm portion placed opposite to a respective operating member, a respective surface inclined with respect to said directions of actuation, said bolt being pivotably mounted about said pivot means on the center of the said first arm for pivoting said first arm between a first position wherein said first arm is parallel to the plane containing the said two directions of actuation and a second position, wherein the stop surface of one of the said portions of said first arm is disposed opposite to that one of said operating members which is thus prevented to move into its second position, whereas the other operating member is in its second position and cooperates with the respective inclined surface to pivot the said first arm into said second position.

4,327,261

APPARATUS FOR SENSING A DISTENDED LOCATION ON A DRILL PIPE

Loren B. Sheldon, Houston, Tex., assignor to BJ-Hughes Inc., Houston, Tex.

Continuation of Ser. No. 777,673, Mar. 15, 1977, abandoned.
This application Jan. 12, 1979, Ser. No. 3,035
Int. Cl.[3] H01H *3/16, 21/28;* B25B *1/04*
U.S. Cl. 200—61.41 **12 Claims**



1. Apparatus for sensing a distended location on the exterior surface of a drill pipe comprising:

a sensor arrangement including an arm contactable with the exterior surface of a drill pipe and pivotally movable with respect thereto from a first, normal, position to a second, deflected, position;

means for positioning said sensor arrangement relative to said pipe exterior to dispose said arm in contact with the drill pipe; and

means actuated by said arm in said second position for generating an electrical signal when said arm is deflected a predetermined angular amount from said normal position by a distended location of a predetermined diameter on a drill pipe.

4,327,262

GAS-BLAST SWITCH

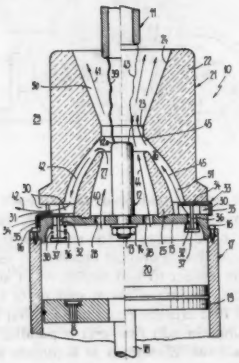
Peter Kull, Schafisheim, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed Jan. 21, 1980, Ser. No. 114,230

Claims priority, application Switzerland, Feb. 13, 1979, 1395/79

Int. Cl.³ H01H *33/88*

U.S. Cl. 200—148 A **8 Claims**



1. A gas-blast switch comprising:

a fixed contact element;

a movable contact element cooperating with said fixed contact element;

a blast nozzle operatively associated with one of the contact elements;

means defining a pump chamber containing an extinguishing gas which can be placed under pressure during the course of a cutoff stroke of the gas-blast switch;

said pump chamber having an outlet;

said blast nozzle having an inlet connected with the outlet of the pump chamber;

said blast nozzle having a nozzle throat arranged downstream with respect to the flow direction of the extinguishing gas from an end of the related contact element;

a valve arrangement disposed between the inlet of the blast nozzle and the pump chamber;

said valve arrangement being pre-biased in its closing direction and responding to excess pressure prevailing in the pump chamber and opening in the direction of the inlet;

said valve arrangement comprising at least one switching valve movable between a rest position and a work position;

means for biasing said switching valve into its rest position;

said switching valve, when in said rest position, flow communicating the inlet of the blast nozzle with a space surrounding said blast nozzle and disconnecting the inlet of the blast nozzle from the pump chamber; and

said switching valve being movable into its work position in response to excess pressure prevailing in the pump chamber; and

said switching valve, when in said work position, flow communicating the pump chamber with the inlet of the blast nozzle and disconnecting the blast nozzle from the surrounding space.

4,327,263

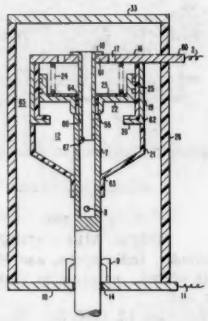
SWITCHING DEVICE

Takeyoshi Sakurai, Amagasaki, and Noboru Kobayashi, Kobe, both of Japan, assignors to Mitsubishi Denke Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1980, Ser. No. 160,249

Int. Cl.³ H01H *33/88*

U.S. Cl. 200—148 A **1 Claim**



1. A switching device comprising:

a pair of contact members capable of engagement with and separable from each other, said contact members having respective openings therein;

a cylinder surrounding and coaxial with said contact members and forming a chamber containing therein an arc-extinguishing fluid, said arc-extinguishing fluid being pressurized by the arc drawn between said contact members during separation thereof; and

additional pressurizing means for pressurizing said arc-extinguishing fluid within said chamber, said additional pressurizing means including an interlocking member disposed on said cylinder and capable of an interlocked movement with said contact members during separation thereof, interlocked movement of said interlocking member during contact member separation pressurizing said arc-extinguishing fluid within said chamber.

4,327,264

FASTENING DEVICE FOR A SWITCH

Jakob Botz, Ingersheim; Rolf Feger, Bietigheim-Bissingen; Erich Mutschler, Bietigheim-Bissingen; Hubert Spazierer, Bietigheim-Bissingen, and Adam Weber, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 898,767, Apr. 21, 1978, abandoned. This application Mar. 3, 1980, Ser. No. 126,327

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1977, 2719194; Dec. 31, 1977, 2759182

Int. Cl.³ H01H *9/08*; G12B *9/00*

U.S. Cl. 200—295 **3 Claims**

1. A fastening device for a switch housing comprising:

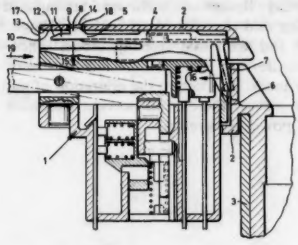
a receiving member comprising a cavity adapted to receive said switch housing, said cavity having a side wall forming a limiting surface for limiting lateral movement of said switch housing, and a rear wall perpendicular to said side wall, said side wall having a shoulder;

at least one resilient holding element, said resilient holding element including a portion adapted to engage said shoulder said resilient holding element urging said portion in a first direction into engagement with said shoulder;

means for connecting said resilient holding element to said switch housing; and

at least one resilient second element disposed between said switch housing and said rear wall for urging said housing away from said rear wall and thereby for urging said

portion in a second direction into engagement with said shoulder, said second direction being substantially perpendicular to said first direction, wherein said resilient second



element is integrally connected with said resilient holding element and said connecting means comprises a movable web connecting said resilient second element and said switch housing.

4,327,265

METHOD FOR PRODUCING ONE OR MORE CONTACT CONNECTIONS BETWEEN A LACQUER-INSULATED WIRE AND ONE OR MORE CONTACT PARTS OF AN ELECTRIC COMPONENT

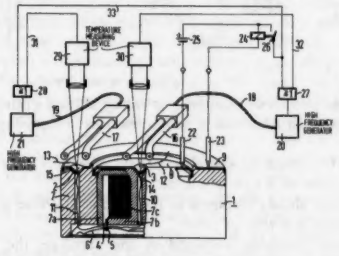
Egon Edinger, Graefelfing, and Friedrich Pedall, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 25, 1980, Ser. No. 133,927

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1979, 2916349

Int. Cl.[3] **H05B** *6/06;* **B23K** *13/00, 31/02*

U.S. Cl. 219—10.41 **1 Claim**



1. A method for producing at least two contact connections at at least two solder locations between a lacquer-insulated wire which rapidly becomes brittle with excessive heat and corresponding contact member at each solder location of an electrical component by means of soft solder, comprising the steps of: providing an apportioned solder amount and a separate high frequency generator heat source which is allocated to each of said at least two solder locations; providing a temperature measuring device at each solder location by which a temperature of the solder location is monitored; switching on the heat sources; switching off both heat sources simultaneously when an electrical contact is established between both lacquer-insulated wires and their contact members as determined by current flow from one of the contact members through the lacquer insulated wire to the other contact member with the two contact connections being series connected by said electrical component and when a predetermined maximum temperature has not been attained at either location; monitoring a temperature at both soldering locations and switching off one of the heat sources before the other if the temperature measured at said one soldering location exceeds said predetermined maximum prior to electrical contact at both solder locations and while continuing to heat the other location until either said maximum temperature is attained or wire contact at both solder locations is achieved.

4,327,266

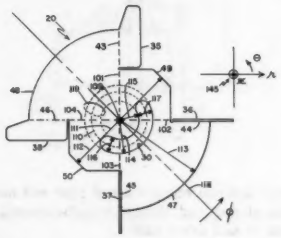
MICROWAVE OVENS FOR UNIFORM HEATING

Buddy J. Austin, Atkins, and James E. Simpson, Coralville, both of Iowa, assignors to Amana Refrigeration, Inc., Amana, Iowa

Filed Sep. 12, 1980, Ser. No. 186,490

Int. Cl.[3] **H05B** *6/74*

U.S. Cl. 219—10.55 F **16 Claims**



1. A microwave oven comprising a main oven body having walls and a reclosable door defining a heating cavity and further comprising a high frequency feeder section having a feeder opening for supplying microwave energy into said heating cavity wherein the improvement comprises

a planar antenna plate having one and only one inner edge defining a single aperture for admission of said microwaves from only a part of said feeder opening directly across the plane of said plate to said cavity, said antenna plate comprising electrically conductive material having a periphery and having a plurality of conductive wings on said periphery, said aperture having a bisector being a one and the only one axis of bilateral symmetry of said antenna plate, said plate being located to have a spacing from said feeder opening so as to permit propagation of said microwave energy from the rest of said feeder opening to said wings and to said cavity;

shaft means for extending through said feeder opening and being attached at a point of attachment to and holding said plate for said spacing of said plate from said feeder opening, said aperture being shaped so that the longest straight line which can be drawn inside said aperture along a radius through said point is shorter than the longest straight line which can be drawn inside said aperture perpendicular to any radius through said point; and

means for rotating said plate so that said inner edge rotates relative to said feeder opening,

whereby uniform microwave heating of a body to be heated in said cavity is achievable.

4,327,267

HIGH FREQUENCY ENERGY SUPPLY IN A HIGH FREQUENCY HEATING APPLIANCE

Nobuo Ikeda, and Hirofumi Yoshimura, both of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 29, 1980, Ser. No. 173,496

Claims priority, application Japan, Sep. 10, 1979, 54-125843[U]

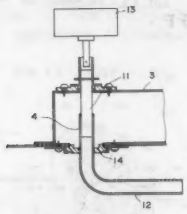
Int. Cl.[3] **H05B** *6/72*

U.S. Cl. 219—10.55 F **3 Claims**

1. In an energy feeding device for a high frequency heating appliance including a heating chamber, said energy feeding

device having a high frequency oscillator for generating high frequency electromagnetic wave energy, a waveguide for transmitting high frequency electromagnetic wave energy from said oscillator, a rotary antenna for transmitting high frequency electromagnetic wave energy from said waveguide into the heating chamber, and a driving means for rotating said rotary antenna, the improvement comprising:

a revolving drive shaft connected to said driving means at one end of said drive shaft and being made of a material having a low dielectric loss;



said rotary antenna being a metal pipe and having a socket portion at one end thereof which connects said rotary antenna to said drive shaft;

the end of said socket portion having a substantially larger inner diameter than said one end of said drive shaft which forms a radial clearance between the inner periphery of the socket end and the outer periphery of said drive shaft; and the end of said socket portion being rounded.

4,327,268

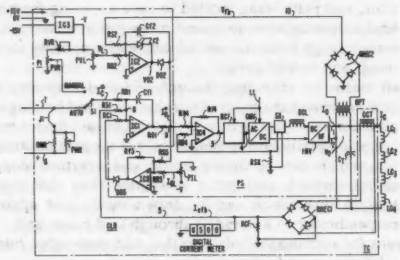
CURRENT CONTROL SYSTEM FOR AN INDUCTION HEATING APPARATUS

William E. Frank, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 30, 1980, Ser. No. 154,691

Int. Cl.[3] H05B *6/08*

U.S. Cl. 219—10.77 **1 Claim**



1. In an induction heating apparatus having induction coil means supplied with high frequency high power current from a tank circuit energized under a voltage supplied by a power generator; the combination of:

means for sensing coil current drawn by said induction coil means from said tank circuit;

first feedback means responsive to said current sensing means for deriving a coil current feedback signal;

current controller means normally responsive to said coil current feedback signal for applying to said power generator a control signal for adjusting said coil current;

second feedback means responsive to the voltage applied by said power generator to said tank circuit for deriving a voltage feedback signal;

a steering diode; and

voltage limited means operative in a comparator mode in response to said voltage feedback signal and a reference voltage signal for backbiasing said steering diode until said supplied voltage exceeds a predetermined critical voltage determined by said reference voltage signal;

with said voltage limiter means forward biasing said steering diode when said predetermined critical voltage has been exceeded; and with said steering diode, when forward biased, transferring said voltage limiter means into an integrator mode for limiting the operation of said current controller means, thereby to prevent excessive voltage from said power generator.

4,327,269

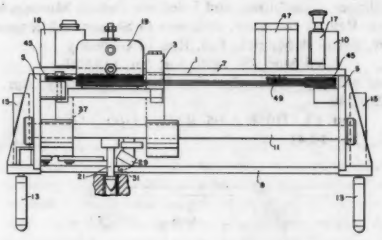
APPARATUS FOR CONTINUOUSLY WELDING A PORTION OF A ROW OF TUBES TO A TUBESHEET

Raymond Glatthorn, St. Petersburg, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 23, 1980, Ser. No. 162,266

Int. Cl.[3] B23K *9/02*

U.S. Cl. 219—60.2 **9 Claims**



1. Apparatus for continuously welding at least a portion of a row of tubes to a tubesheet, said apparatus comprising:

a base;

means for attaching said base to said tubesheet over at least a portion of a row of tubes;

a carriage slidaly disposed in the base to traverse at least a portion of a row of tubes;

a spindle rotatably disposed in the carriage, the spindle having a centrally disposed guide pin, which fits inside a tube, the guide pin being slidably disposed in said spindle, said spindle having means disposed therein for sliding said guide pin in and out of the tube;

means for applying frictional resistance to the spindle to prevent it from turning, except when the guide pin is in a tube;

a welding torch disposed in said spindle adjacent said guide pin;

a sheave disposed on the spindle;

sheaves disposed adjacent the ends of the base;

continuous belting means engaging said sheaves adjacent said ends of the base and looping around said spindle sheave;

means for driving said belting means;

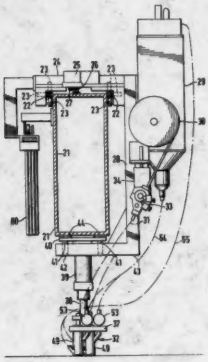
means for intermittently operating the means for sliding the guide pin in and out of a tube, whereby the welding torch will move rectilinearly when the guide pin is not in a tube and follow a circular path when the guide pin is in a tube forming a continuous weld to weld at least a portion of a row of tubes to the tubesheet.

4,327,270

SUBMERGED-ARC SPOT WELDING APPARATUS

Börje R. Lundin, Laxa, Sweden, assignor to ESAB Aktiebolag, Sweden

Continuation of Ser. No. 890,933, Mar. 28, 1978, abandoned. This application Aug. 15, 1980, Ser. No. 178,452
Claims priority, application Sweden, Mar. 28, 1977, 7703491; May 9, 1977, 7705343
Int. Cl.[3] B23K 9/18
U.S. Cl. 219—73.2 16 Claims



12. Apparatus for submerged-arc spot welding, comprising a track spaced from support means for supporting a structure to be welded; a carriage supported and guided by said track; welding means supported by said carriage; a thrust member supported by said carriage and movable between a first position in which said thrust member engages a structure to be welded and a second position in which said thrust member is spaced a distance from a structure to be welded; motive means for moving said thrust member between said first and second positions, said motive means including a cylinder movable with respect to said carriage towards and away from a structure to be welded and a single piston rod associated with said cylinder, said piston rod being rigidly connected to said thrust member and mounted for reciprocating movement in said cylinder; guiding means for guiding the movement of said cylinder with respect to said carriage; first stop means for limiting the movement of said cylinder towards a structure to be welded; and second stop means rigidly connected to said track and extending along said track for limiting the movement of said cylinder away from a structure to be welded when said thrust member is in said first position, said second stop means abutting said cylinder when said thrust member is in said first position and cooperating with said cylinder and said guiding means to completely immobilize said welding means during a submerged-arc spot welding operation carried out when said thrust member is in said first position.

4,327,271

CONDENSATION HEATING APPARATUS

Peter D. Bentley, Brighton, and James F. Pollock, Hook, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed May 16, 1980, Ser. No. 150,429
Int. Cl.[3] B23K 1/00, 31/02; H05K 3/34
U.S. Cl. 219—85 E 4 Claims

1. Condensation heating apparatus comprising,

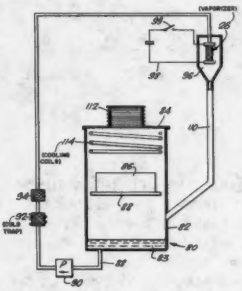
(a) a chamber;

(b) a removable closure portion of the chamber to enable an article to be inserted into and withdrawn from the chamber;

(c) a flexible portion of the chamber arranged to be free to respond to the pressure inside the chamber so as to equalise the pressure inside the chamber with atmospheric pressure by the flexure of said flexible portion;

(d) a permeable electrically conducting matrix outside the chamber for heating a liquid to cause vaporization thereof;

(e) a first duct downwardly extending from the matrix to the chamber so as to introduce the vapour into the chamber;



(f) an electric circuit connected to the matrix for energising the matrix;

(g) a displacement pump for displacing the liquid through the matrix;

(h) a second duct for connecting the pump to the matrix and

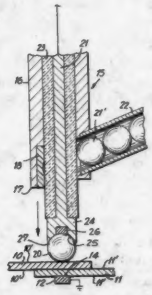
(i) a drain means for draining the vapor condensed in the chamber and for connecting the chamber to the pump.

4,327,272

METHOD FOR SPOT WELDING GALVANIZED SHEET METAL

Milton Hinden, Massapequa, N.Y., assignor to The Hinden Trust, Massapequa, N.Y.

Filed Mar. 14, 1979, Ser. No. 20,443
Int. Cl.[3] B23K 11/16
U.S. Cl. 219—94 11 Claims



1. The method of connecting two superimposed sheets of galvanized coated ferrous metal by welding which comprises the steps of contacting an area of an outer surface of one of said superimposed sheets with a first electrode, contacting an outer surface of the other of said superimposed sheets at an area in registry with said area contacted by said first electrode with a consumable ferrous metal member having a greater hardness than the galvanized coating to provide the necessary penetration to the ferrous metal of said superimposed sheets, said consumable metal member having a reduced contact area engaging said surface of said other sheet, contacting a major portion of the surface of said consumable metal member with a conductive carrier electrode, and continuously urging said

carrier electrode toward said first electrode while simultaneously passing an electrical current between said electrodes sufficient substantially to deform said consumable metal member and to interfuse contacting portions of said sheets disposed between said member and said first electrode.

4,327,273

METHOD OF TREATING A WORKPIECE WITH ELECTRON BEAMS AND APPARATUS THEREFOR

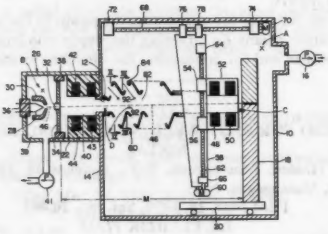
Hisanao Kita; Yoshinori Karatsu; Takamitsu Nakazaki, and Yoji Akutsu, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 19, 1980, Ser. No. 131,857

Claims priority, application Japan, Mar. 23, 1979, 54-34768; Jun. 6, 1979, 54-70038

Int. Cl.³ B23K *15/00*

U.S. Cl. 219—121 EC **3 Claims**



1. An apparatus for treating a workpiece with electron beams comprising:

a first vacuum chamber;

an electron beam gun disposed in said first vacuum chamber for generating electron beams, said electron beam gun including a filament, a grid or cathode, and an anode with an aperture;

a first focusing coil disposed on the downstream side of said anode of said electron beam gun for focusing the electron beams on said workpiece to be treated;

a first deflecting coil disposed on the downstream side of said first focusing coil;

a second vacuum chamber having a front wall with an aperture and a rear wall and enclosing said workpiece therein, said second vacuum chamber hermetically fixed to said first vacuum chamber, and said aperture of said second vacuum chamber opposed said aperture of said anode of said electron beam gun;

the distance between the rear wall of said second vacuum chamber and said anode of said electron beam gun being such that said workpiece is allowed to separate from said anode of said electron beam gun by a distance larger than the mean free path of gas molecules generated in treating said workpiece;

a second focusing coil disposed between said aperture of said second vacuum chamber and said workpiece in said second vacuum chamber, for focusing the electron beams on said workpiece; and

a second deflecting coil disposed on the downstream side of said second focusing coil in said second vacuum chamber.

4,327,274

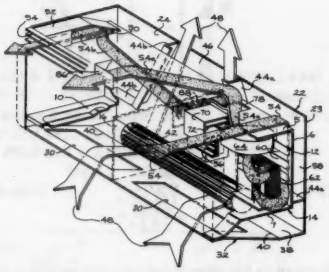
VENTILATION SYSTEM FOR COMBINATION MICROWAVE OVEN AND EXHAUST VENT

James A. White, Louisville; Frank L. Rice, Jeffersontown, and Walter E. Lewis, Louisville, all of Ky., assignors to General Electric Company, Louisville, Ky.

Continuation of Ser. No. 935,436, Aug. 21, 1978, abandoned. This application Apr. 23, 1980, Ser. No. 142,943

Int. Cl.³ H05B *6/64*; F24C *15/30*

U.S. Cl. 219—10.55 R **17 Claims**



1. An assembly combining a microwave oven appliance with an exhaust vent hood, said assembly adapted for positioning in an elevated position above a cooking surface, comprising:

means forming a housing for said appliance having a top, a bottom and a rear surface,

means forming a support structure for said housing having a top and a back wall, said support structure adapted for mounting in said elevated position independently of said housing, said housing and support structure having cooperation means for slidably moving said housing into and out of said structure with said top surface of said housing positioned below said top wall of said structure,

elongated rib means spacing said rear surface from said back wall; said rear surface, back wall and rib means defining a first channelized air space therebetween when said housing is within said structure,

plate means spaced below said bottom surface for providing a second air space therebetween, said first and second air spaces communicating with one another, said plate means defining an opening through which air can flow from a level below said plate means into said second air space,

means enclosing the sides of said second air space for channelizing the same,

means for forcibly moving air from below said plate into said second air space, and through said second air space into and through said first air space,

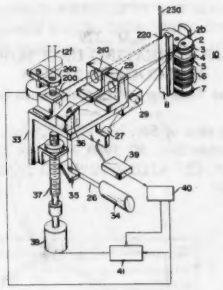
an air entry formed in said rear surface of said housing, means for drawing oven cooling air into said housing through said entry, and

means, including said housing, said support structure and said rib means, forming a third channelized air space separate from said first and second air spaces and communicating with said air entry in said rear surface for providing oven cooling air to the interior of said oven separate from air flowing through said first and second air spaces.

4,327,275
LASER WELDING OF AN ELECTRON GUN

Shuuji Asaba, Fujisawa; Minoru Nemoto, Yokohama; Kenji Ushimi, Sagamihara, and Akira Ono, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 9, 1979, Ser. No. 93,138
Claims priority, application Japan, Nov. 14, 1978, 53-139339
Int. Cl.³ B23K *26/04*
U.S. Cl. 219—121 LD **7 Claims**



1. A method for laser beam welding a strap conductor to an electrode of an electrode gun, the strap conductor for applying a voltage to a predetermined portion of the electrode, comprising the steps of:

disposing a strap conductor at a predetermined position along a surface of the electrodes to be laser beam welded to the electrodes;

providing a laser beam generator for generating, upon actuation, a laser beam for welding, the laser beam having a predetermined optical axis;

providing a positioning light source for generating a positioning light beam having an optical axis bearing a fixed predetermined relationship to the optical axis of the laser beam;

causing relative movement of the electrodes and strap conductor relative to the optical axes of the laser and positioning beams;

causing said positioning beam to be incident on an edge of the surface of the electrode, the positioning beam being at least partially reflected therefrom;

detecting reflected light obtained when said positioning light beam is reflected by the edge of the electrode from the point to be welded, light reflected from portions of the electrode other than the edge being stopped by a pin hole aperture;

stopping said relative movement in response to the detection of the reflected light; and

actuating the laser beam generator so as to expose a welding point of the strap conductor to the laser beam for welding in response to the detection of said reflected light so as to effect welding of the electrode and strap conductor together.

7. An apparatus for welding a strap conductor to an electrode of an electron gun, comprising:

a laser beam generator for producing a laser beam for effecting the welding of electron gun parts including said electrode and strap conductor to be welded together,

a positioning light source for producing light for positioning a welding point,

a light-sensing means for (a) detecting reflected light obtained when said light for positioning is reflected by an edge of said electrode which corresponds to said welding point but differs from the welding point and (b) generating a position signal in response to the detection, the light sensing means including a lens for focusing light reflected from the electrode, a pin-hole aperture positioned at the focus of the lens for blocking light reflected from the electrode other than from the edge and an optical sensor for detecting light passing through the pinhole, whereby only light reflected from the edge is detected by the sensor,

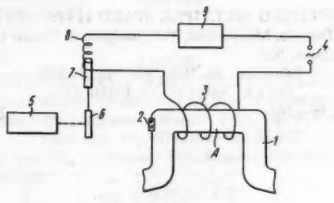
a means for causing relative movement of the optical axes of said laser beam and positioning light source, said axes having a fixed predetermined positional relation to each other, with respect to the electrodes and strap conductor, and

a means for controlling the operation of said moving means according to said positioning signal generated by said light-sensing means.

4,327,276
WATER TREATMENT APPARATUS

Viktor M. Injushin, ulitsa Shevchenko, 162"D", kv. 18., Alma-Ata; Valentin I. Khokhlov, oblast, Kaskelensky raion, selo Kargalinka, ulitsa Kirova, 32, Alma-Atinskaya, both of U.S.S.R.; Fedor Akhremenko, deceased, late of Ust-Kamenogorsk, U.S.S.R., and by Galina T. Akhremenko, administrator, ulitsa Burova, 45, kv. 42, Ust-Kamenogorsk, U.S.S.R.

Filed Feb. 27, 1980, Ser. No. 125,251
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 L **3 Claims**



1. A water treatment apparatus, comprising: a water line; a circuit having a coil mounted about said water line and an electric power source connected thereto; an electromagnet in said circuit and a timer in series with said coil; one section of said water line provided with a light inlet port made of a transparent material; a source of monochromatic light having an axis thereof aligned with a geometric center of said inlet port in said water line section; and a screen mounted connected to be actuated by said electromagnet under control of said timer for periodic interruption of said beam radiated by said source of monochromatic light.

4,327,277
METHOD FOR LASER SOLDERING

Kevin R. Daly, Stow, Mass., assignor to Raytheon Company, Lexington, Mass.

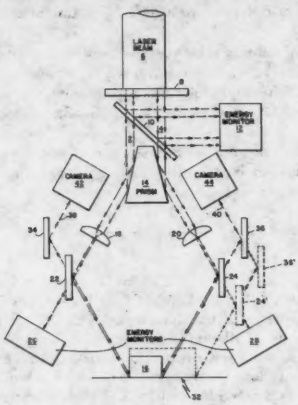
Continuation of Ser. No. 936,671, Aug. 24, 1978, abandoned.
This application May 19, 1980, Ser. No. 150,768
Int. Cl.³ B23K *26/00, 1/12*
U.S. Cl. 219—121 LD **4 Claims**

1. A method of soldering an electronic chip component having solder on opposing ends to two supporting conductor pads connected to a substrate, comprising the steps of:

providing pulsed coherent laser radiation having pulse widths of less than 10 milliseconds with a repetition rate of less than 10 pulses per second, the pulse train duration of said radiation being less than one second;

separating said radiation into two simultaneous spatially separate beams having substantially equal energy;

directing said beams inward toward said opposing ends of said electronic chip component to reflow said solder; and



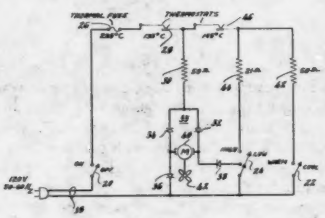
removing said beams to substantially simultaneously form solder joints between said component and said pads.

4,327,278

SIMPLIFIED MULTIPLE SPEED HAIR DRYER

John W. Tomaro, Maplewood, N.J., assignor to Conair Corporation, Edison, N.J.

Filed Sep. 10, 1979, Ser. No. 74,389
Int. Cl.[3] A45D *20/10*; H05B *1/02*
U.S. Cl. 219—364 **2 Claims**



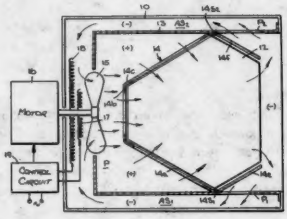
1. A two speed, multiple heat hair dryer comprising:
means for coupling said hair dryer to a source of potential,
first and second heater elements,
a bridge rectifier circuit,
a d.c. motor connected across said bridge rectifier circuit,
first switch means connected to an arm of said bridge rectifier circuit for switching said arm into and out of said bridge rectifier circuit,
means for coupling said first heater element and said bridge rectifier circuit in series across said source of potential,
said d.c. motor being driven at a first speed when said first switch mmeans is open and at a second higher speed when said first switch means is closed,
said second heater element being electrically connected to said first switch means for simultaneously electrically coupling said second heater element in parallel to said first heater element across said source of potential through said first switch means when said arm of said bridge rectifier circuit is switched into said bridge rectifier circuit,
a third heater element and second switch means for selectively electrically coupling said third heater element across said source of potential through said second switch means,
said first heater element providing a first heat level when said first and second switch means are open,
said first and second heater elements providing a second heat level when said first switch means is closed, and said second switch means is open,
said first and third heater elements providing a third heat level when said second switch means is closed and said first switch means is open, and
said first, second and third heater elements providing a fourth heat level when said first and second switch means are closed.

4,327,279

COUNTER-TOP REHEATING UNIT FOR PACKAGED PRE-COOKED MEALS

Raul Guibert, Los Angeles, Calif., assignor to Sunsetl, Ltd., Los Angeles, Calif.

Continuation-in-part of Ser. No. 97,787, Nov. 27, 1979. This application Dec. 30, 1980, Ser. No. 221,208
Int. Cl.[3] A21B *1/22*; F27D *11/02*
U.S. Cl. 219—400 **6 Claims**



1. A counter-top reheating unit for packages containing pre-cooked meals, the unit being adapted to quickly raise the temperature of the meals to a service temperature level that is below the temperature at which cooking takes place, said unit comprising:
A. a box-like case having an inner box nested therein, said case and said box having an open front; the dimensions of the inner box relative to the case being such as to define a rear air space and side air spaces communicating therewith;
B. a compartment for accommodating a stack of said packages with spacings therebetween, said compartment fitting within the inner box and having a perforated rear wall spaced from the rear of the inner box to define therewith a plenum, said compartment having a front air space leading to said side air spaces; and
C. means to heat the air in the rear air space to a temperature well above the service temperature level and to blow the resultant hot air into said plenum to create a positive pressure therein, thereby developing a negative pressure in said air spaces, the resultant pressure differential forcing the hot air through said perforated wall and causing the hot air to flow at high velocity through said package spacings in heat exchange relationship with said precooked meals, the hot air then passing from the front air space into said side air spaces and back to said rear air space to create a flow loop recirculating the hot air through said compartment.

4,327,280

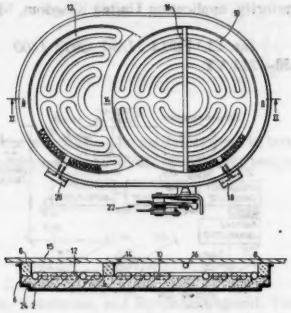
SMOOTH TOP COOKERS

Joseph A. McWilliams, Droitwich, England, assignor to Micropore International Limited, Droitwich, England

Filed Feb. 6, 1980, Ser. No. 118,951
Int. Cl.[3] H05B *3/76*
U.S. Cl. 219—464 **13 Claims**

1. In an electric cooker having a continuous smooth top and

at least one radiant heater located against the underside of the smooth top, the smooth top being transparent and substantially non-absorptive to radiant cooking heat, and at least one radiant heater comprising a metal dish having a base supporting a base layer of thermal insulating material and a sidewall against which a peripheral wall of thermal insulating material is mounted; and at least two heater elements supported on said base layer of thermal insulating material with a dividing wall of thermal insulating material therebetween, said dividing wall extending to a height substantially equal to the height of said peripheral wall, and both walls extending beyond the sidewall of the metal dish to the underside of said smooth top; wherein one of said elements is encircled by said dividing wall and a part of said peripheral wall to define with a first portion of the smooth top a first chamber, said first portion of the smooth top



constituting a first heating zone effective over a predetermined first planar area of the smooth top upper surface, said one element being energisable independently to heat said first zone and said encircling wall preventing loss of radiant cooking heat outside of the encircled area; and wherein said other element is surrounded by a wall of thermal insulating material to define with a second portion of the smooth top a second chamber, said section portion of the smooth top constituting a second heating zone effective over a predetermined second planar area of the smooth top upper surface adjacent to and contiguous with said first area, said surrounding wall comprising said dividing wall and a part of said peripheral wall and said two heater elements being energisable together to heat both zones and generate heat over an elongated planar area bounded by said peripheral wall.

4,327,281

AQUARIUM IMMERSION HEATER WITH DRY OPERATION PREVENTION THERMOSTATIC SWITCH

Wolfgang Jager, Wustenrot-Finsterrot, Fed. Rep. of Germany, and Erhard Boettger, El Segundo, Calif., assignors to Ebo-Jager, Inc., El Segundo, Calif.

Filed Feb. 19, 1980, Ser. No. 122,000

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1979, 2927280

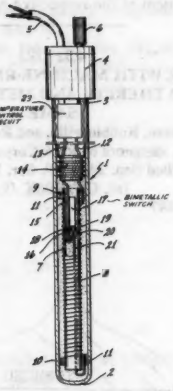
Int. Cl.³ H05B *1/02, 3/80*

U.S. Cl. 219—523 **4 Claims**

1. In an aquarium heater having a tubular housing, and with a control circuit in the upper part of the housing for temperature responsive off and on switching of a heating element disposed in the lower part of the housing, and with the heating element constructed by an elongated non-metallic support tube on which a helical heating wire is wound, the improvement comprising

a temperature responsive breaker switch coupled within a feed line leading to one end of the heating wire,

the temperature responsive breaker switch located slightly below the upper end in the interior of the elongated non-metallic support tube supporting the heating wire and extending within a number of turns of the heating wire and with the length of the breaker switch within the number of turns supported on the elongated support tube representing a small fraction of the length of the elongated support tube, and



with the space between the tubular housing wall and the tube supporting the heating wire and the interior space of tube supporting the wire filled with sand so that the temperature responsive breaker switch is completely enclosed by sand. pg,10

4,327,282

ELECTRICAL RESISTANCE HEATING ELEMENT

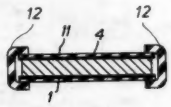
Karl-Heinz Nauerth, Erlenbach, Fed. Rep. of Germany, assignor to Firma Fritz Eichenauer, Kandel, Fed. Rep. of Germany

Filed Oct. 18, 1979, Ser. No. 86,175

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1978, 2845965

Int. Cl.³ H05B *3/02*

U.S. Cl. 219—541 **14 Claims**



1. An electrical resistance heating element comprising electrical resistance heating means including at least one heating conductor element made of a material with a positive temperature coefficient of electrical resistance and having opposite substantially planar surfaces; substantially planar, electrically conductive contact means on the opposite surfaces of said heating conductor element; electrical connecting elements for said heating means including two substantially planar, electrically conductive contact plates having a size and shape corresponding substantially to the layout of the heating means and being respectively placed loosely upon the opposite surfaces of the heating conductor element so that it is sandwiched therebetween, a planar surface of each contact plate being in contact with a respective contact means on said heating conductor

element, and electrical connecting terminals for said contact plates; and electrically non-conductive securing means including holding elements, each of which is applied along respective edges of the contact plates for holding the contact plates elastically against the opposite surfaces of said at least one heating conductor element at the respective edges thereof.

4,327,283

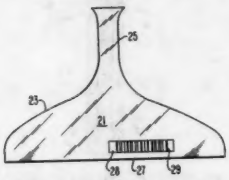
WORKPIECE WITH MACHINE-READABLE MARKING RECESSED THEREIN AND METHOD OF MAKING SAME

Philip M. Heyman, Robbinsville, and Robert L. Quinn, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 24, 1979, Ser. No. 78,440

Int. Cl.³ G06K *19/02*

U.S. Cl. 235—487 **8 Claims**



1. A workpiece comprising a main body, a thin coating on a portion of said body, and an undercoating between, and in direct contact with, said coating and said main body, said coating and said undercoating being integral with said main body, said coating having an external surface and a coded machine-readable marking in said external surface, said marking comprising a related sequence of substantially parallel bars of at least two different widths recessed into said surface and through said coating, and separated by substantially parallel spacings, said bars and the surrounding surface having substantially different light reflectances.

4,327,284

FOCUSING DETECTION DEVICE

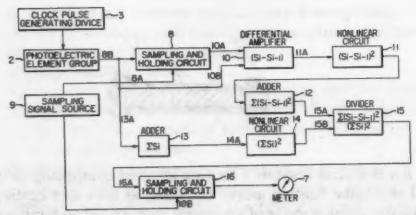
Toshitatsu Suzuki, Yokohama, Japan, assignor to Ricoh, Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1980, Ser. No. 129,627

Claims priority, application Japan, Mar. 17, 1979, 54/31290

Int. Cl.³ G01J *1/36*

U.S. Cl. 250—204 **3 Claims**



1. A focusing detection device characterized in that it comprises a group of photoelectric elements which share a small light receiveing area in an imaging surface or in a surface optically equivalent thereto and which are disposed adjacent to one another; an electrically driving device for sequentially obtaining an output from one of the terminals of the photoelectric element group; a circuit for sampling and holding an output from said one terminal; a device for obtaining the difference between the output of the photoelectric element group and the output of the photoelectric element before the sampling and holding is effected; a circuit for nonlinearizing the output of the device for obtaining the difference; a device for summing the output of this circuit over part or the entirety of the photoelectric element; and a device for obtaining extreme values within the range of the displacement of an optical image rendered to the photoelectric elements corresponding to the summed value.

4,327,285

ELECTRON-OPTICAL IMAGE TUBES AND STREAK CAMERAS

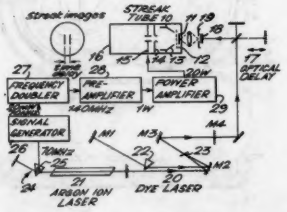
Daniel J. Bradley, 51 Wellington Rd., Dublin 4, Ireland

Filed Mar. 23, 1979, Ser. No. 23,312

Claims priority, application United Kingdom, Mar. 23, 1978, 11546/78

Int. Cl.³ H01J *31/50*; G01J *1/00*

U.S. Cl. 250—213 VT **22 Claims**



1. Apparatus for obtaining a record of repetitive optical phenomena having durations in the picosecond or subpicosecond range, comprising an image tube for receiving repetitive pulse-form images and converting them to electron images; electron deflecting means to deflect the electrons in their passage through the tube; a continuous wave mode-locked laser arranged to generate a repetitive series of pulses; guide means for directing the laser pulse train to the image tube; means to supply to the deflecting means a time-resolving scanning voltage; means to scan the electron images in the tube in a linear direction; synchronising means to synchronise the deflection of the electron images in the tube with the repetition rate of the pulse train from the continuous wave mode-locked laser; and means to scan the electron image across the tube to read out the time-resolved image profile.

4,327,286

METHOD AND APPARATUS FOR MEASURING THE RISK OF ICE FORMATION

Andreas Thoma, Germering, Fed. Rep. of Germany, assignor to Apparatebau Gauting GmbH, Gauting, Fed. Rep. of Germany

Filed Jul. 7, 1980, Ser. No. 166,167

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1979, 2928208

Int. Cl.³ G01W *1/00*

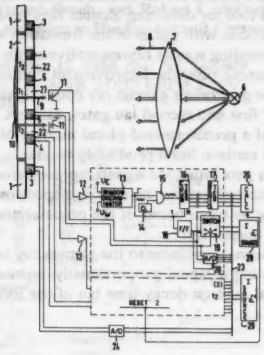
U.S. Cl. 250—231 R **18 Claims**

1. The method of recognizing a risk of icing on a surface subject to continuous or graduated temperature varitation in which the icing over of the surface is detected by directing light on the surface and measuring the light back-scattered by ice, and characterized by:

cooling two detection surfaces to different temperatures;

measuring the times within which the detection surfaces ice over after cooling has begun; and

determining the temperature of the detection surfaces in the iced-over state and the temperature of said first mentioned



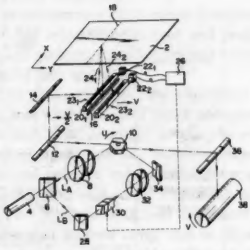
surface, the risk of icing being determined in terms of time of the ice formation at points of different temperature.

4,327,287

LASER SCANNING APPARATUS

Tutomu Saito, Yokohama, and Ryoji Yamaguchi, Yutaka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 7, 1980, Ser. No. 119,636
Claims priority, application Japan, Feb. 14, 1979, 54-14923
Int. Cl.³ G02B 27/17
U.S. Cl. 250—234 **12 Claims**



1. A laser scanning apparatus comprising:

a laser beam source;

a laser beam deflecting means for deflecting a laser beam produced from said laser beam source such that said laser beam scans a stationary document in a main scanning direction thereof;

an optical means provided between said laser beam deflecting means and said stationary document and serving to deflect said laser beam from said laser beam source such that said laser beam scans in an auxiliary scanning direction substantially perpendicular to said main scanning direction, said optical means including a movable reflector system moved in said auxiliary scanning direction while maintaining a constant length of the beam path between said laser beam deflecting means and said document; and

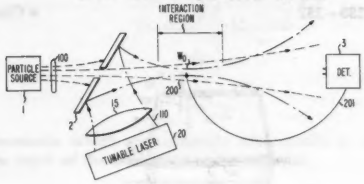
an optical detecting means moved together with said movable reflector system and receiving scattered beam component from said document.

4,327,288

METHOD FOR FOCUSING NEUTRAL ATOMS, MOLECULES AND IONS

Arthur Ashkin, Rumson; John E. Bjorkholm, Holmdel; Richard R. Freeman, Middletown, all of N.J., and David B. Pearson, Staten Island, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 29, 1980, Ser. No. 192,343
Int. Cl.³ H01S 1/00
U.S. Cl. 250—251 **8 Claims**



1. Apparatus for focusing a beam of particles (100) which comprises:

laser means (20) for producing a beam of laser radiation (110);

means (15, 2) for superimposing said beam of laser radiation onto said beam of particles such that both beams propogate substantially along the same axis for an interaction region;

characterized in that

said beam of laser radiation is a TEM^*_{01} mode beam and

said laser beam is detuned from a resonant transition for at least a portion of the particles in said beam of particles by an amount $\Delta\nu$ in the range of values determined by the steps of:

(1) evaluating the parameter 2R as a function of $\Delta\nu$ from the equation

$$R^2 = \frac{w_0^4}{P}\ \frac{2\pi^3 hc}{\lambda^3 \Delta\nu_N}\left(\Delta\nu^2 + \frac{\Delta\nu_N^2}{4}\right)\left[\exp\left(\frac{2E_l}{h\Delta\nu}\right) - 1\right]$$

with

$$E_l = \frac{mw_0^2\Delta\theta^2}{2}\left[1 + \frac{d}{\Delta\nu^{\frac{1}{2}}}\left(1 + a\frac{\Delta\nu}{\Delta\nu^2 + \frac{\Delta\nu_N^2}{4}} + b\frac{1}{\Delta\nu^2}\right)^{\frac{1}{2}}\right]^2$$

where

$$d = \left[\frac{\pi^2 h\Delta\nu_N w_0^2}{3m\lambda^3 v_0}\right]^{\frac{1}{2}}$$

$$a = \frac{\lambda^5\Delta\nu_N}{8\pi^5 cmv_0^2\Delta\theta}\ \frac{P}{w_0^4}$$

$$b = \frac{5\lambda^5 m^2 v_0^4\Delta\theta^4}{32\pi^5 ch^3\Delta\nu_N}\ \frac{P}{w_0^4}$$

P is the laser power, ν_N is the natural linewidth (FWHM) of the particle resonance, c is the speed of light, λ is the wavelength of the laser radiation, m is the particle mass, h is Planck's constant, v_0 is the most probable particle velocity, $\Delta\theta$ is the half-angular divergence of the particle beam, w_0 is the laser beam focal spot size, and $\Delta\nu$, the laser detuning $=\nu-\nu_0$, ν being the laser beam frequency in the particle restframe and ν_0 being the particle resonance frequence for 2R;

(2) determining the value of $\Delta\nu$ which minimizes 2R with $E_l=(mv_0^2\Delta\theta^2/2)$ which value shall be designated $(\Delta\nu_{opt})$ no heat;

(3) determining the value $(2R)_c$, the value of 2R for

$\Delta\nu=(\Delta\nu_{opt})$ no heat, from the equation for R^2 in step 1; and

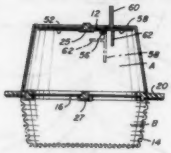
(4) determining the range of values of $\Delta\nu$ between the intersections of the curve of 2R derived from the evaluation in step 1 and the curve $2R=(2R)_c$.

4,327,289

IONIZATION DETECTOR CALIBRATION

Elias E. Solomon, 20 Christina Ct., Duxbury, Mass. 02332

Filed Dec. 26, 1978, Ser. No. 972,661
Int. Cl.³ G01D *18/00*; H01J *47/02*
U.S. Cl. 250—252 **4 Claims**



1. For an ionization detector having a chamber, electrodes associated with the chamber and an ionization source, apparatus for calibrating the detector to simulate the presence of particles of combustion comprising, probe means extendable into the chamber and having a first fixed position wherein the ionization current is unalterable, and a second temporary position wherein the ionization current is lowered to simulate particles of combustion, said probe means being constructed with at least two zones including a first zone of an electrically conductive material and a second zone having an electrical conductivity less than that of the first zone.

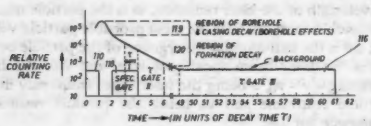
2. For an ionization detector having a chamber, electrodes associated with the chamber and an ionization source, apparatus for calibrating the detector to simulate the presence of particles of combustion comprising, means associated with the chamber and having a first fixed position wherein the ionization current is unaltered, and a second temporary position wherein the ionization current is lowered to simulate particles of combustion, said particle simulation means including attenuation means and means for pivotally supporting the attenuation means whereby in the first position the attenuation means is disposed laterally of and substantially outside of the ionization path and in the second position is pivotally moved at least partially into the ionization path to attenuate ionization current and thus simulate particles of combustion.

4,327,290

METHOD AND APPARATUS FOR NUCLEAR WELL LOGGING WITH OPTIMIZED TIMING FOR SIMULTANEOUS MEASUREMENT OF THERMAL NEUTRON DECAY TIME AND GAMMA RAY PULSE HEIGHT SPECTRA

Ronald E. Plasek, Houston, Tex., assignor to Schlumberger Technology Corp., Houston, Tex.

Filed Nov. 2, 1979, Ser. No. 90,800
Int. Cl.³ G01V *5/00*
U.S. Cl. 250—262 **40 Claims**



6. In apparatus for investigating earth formations traversed by a well bore of the type including a well tool adapted to be moved through the well bore, neutron burst producing means carried by the well tool for irradiating the formation and other well bore media surrounding the well tool with cycles of time-spaced bursts of fast neutrons, and detector means carried by the well tool for detecting gamma rays resulting from neutron interactions with nuclei of the formation and for generating corresponding signals representative of the energies of the detected gamma rays; the improvement comprising:

means for generating gamma ray count signals during plural sets of first and second tau gates, each set occurring after each of a predetermined plural number of neutron bursts by the neutron burst producing means;

means for generating the signals representative of energies of the detected gamma rays during spectroscopy gates occurring between bursts of the predetermined plural number of bursts; and

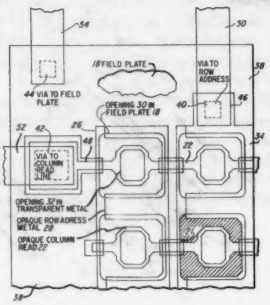
circuit means responsive to the gamma ray count signals for generating a signal proportionally representative of the thermal neutron decay time tau of the formation.

4,327,291

INFRARED CHARGE INJECTION DEVICE IMAGING SYSTEM

Richard A. Chapman; Michael A. Kinch, both of Dallas, and Jaroslav Hynecek, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 16, 1980, Ser. No. 159,991
Int. Cl.³ H01J *31/49*
U.S. Cl. 250—332 **13 Claims**



1. An infrared imager system comprising:

(a) means for focusing infrared energy emanating from a scene;

(b) an infrared detector matrix in the path of the focused infrared energy for converting the infrared energy into electrical signals, said detector matrix having a plurality of charge injection device (CID's) detector elements, each charge injection device detector element having a substrate of semiconductor material, a plurality of electrodes supported by said substrate, said plurality of electrodes including a first non-uniform width electrode centrally disposed as to a second electrode to substantially reduce dark current, said electrodes operative to store charges generated by the infrared energy impinging on the CID element, said charges producing changes in voltages representative of impinging infrared energy; and

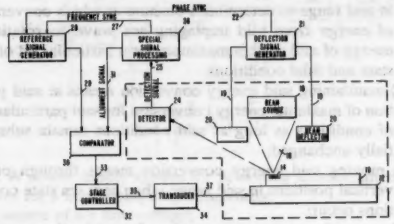
(c) means for producing video signals from the voltage changes representative of the impinging infrared energy.

4,327,292

ALIGNMENT PROCESS USING SERIAL DETECTION OF REPETITIVELY PATTERNED ALIGNMENT MARKS

Victor Wang, Oxnard Beach, and Robert L. Seliger, Agoura, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 13, 1980, Ser. No. 149,600
Int. Cl.³ A61K 27/02; G01M 21/00
U.S. Cl. 250—491 24 Claims



1. A process for aligning the surface of a chosen member with the scan field of a focused beam of radiation or particles which includes the steps of:

(a) providing a set of alignment marks on said surface of said member, said marks in said set being spaced at a predetermined periodicity;

(b) providing a continuous back and forth scanning movement of said beam over said set of alignment marks at a predetermined and fixed velocity to produce a serial detection electrical signal that is indicative of the periodicity of spacing of said set of alignment marks and whose phase angle corresponds to the relative position of said set of alignment marks;

(c) electronically processing said detection signal to generate an alignment signal comprising a fundamental periodic signal of a selected frequency;

(d) providing a reference electrical signal comprising a periodic signal of said selected frequency and predetermined phase, said phase having a predetermined relationship to said scan field of said beam;

(e) comparing the phase angle of said alignment signal and the phase angle of said reference signal and generating an error signal which is proportional to the phase difference of said alignment signal and said reference signal;

(f) providing lateral relative movement between said scan field of said beam and said set of alignment marks in response to said error signal until said alignment signal and said reference signal become congruent in phase whereby highly accurate alignment of said surface of said chosen member with said scan field of said focused beam of radiation is produced.

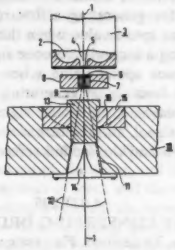
4,327,293

ELECTRON ACCELERATOR AND TARGET WITH COLLIMATOR

Leonhard Taumann, Lafayette, Calif., assignor to Siemens Medical Laboratories, Inc., Walnut Creek, Calif.

Filed Apr. 23, 1980, Ser. No. 143,156
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926841
Int. Cl.³ H05H 7/12; H01J 35/00; G21K 1/00
U.S. Cl. 250—505 5 Claims

1. An electron accelerator structure comprising an acceleration tube, a target exposed to the electron beam issuing from said tube, and a collimator having an aperture for masking an X-ray cone, characterized in that the edge zone of the collimator toward the target is made of a material of low effective cross-section for (gamma, n) processes, whereby neutron generation is reduced, said edge zone having radially to the target



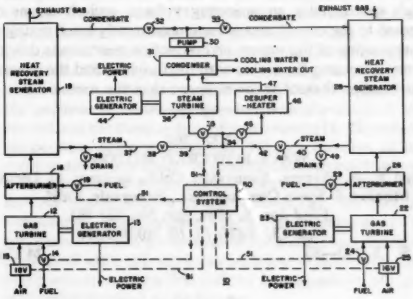
a dimension which approximately corresponds to the half-value depth of the x-radiation in this material.

4,327,294

COMBINED CYCLE ELECTRIC POWER PLANT AND A GAS TURBINE HAVING AN IMPROVED OVERSPEED PROTECTION SYSTEM

Jack R. Smith, Pittsburgh, and Terry J. Reed, North Huntingdon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 495,739, Aug. 8, 1974, Pat. No. 4,167,096.
This application Feb. 5, 1979, Ser. No. 9,013
The portion of the term of this patent subsequent to Sep. 11, 1996, has been disclaimed.
Int. Cl.³ F02C 9/28
U.S. Cl. 290—40 C 6 Claims



1. A combined cycle electric power plant comprising at least one gas turbine, means for generating steam in response to heat energy from said gas turbine, a steam turbine driven by steam supplied to it from said steam generating means, an electric generator driven by said turbine, means for controlling the operation of said turbines and said steam generating means, said controlling means including a gas turbine control system having means for generating an electric fuel reference signal to control the turbine speed and load, at least one throttle valve for said gas turbine, means for controlling the position of said throttle valve to control the flow of fuel to said gas turbine in response to the fuel reference signal from said speed and load controlling means, means for generating an electric signal representative of the turbine speed, means for generating an electric fuel limit signal in response to the speed signal to limit the turbine speed to a predetermined reference value, means for directly coupling the fuel limit signal to said throttle valve position control means to provide relatively fast turbine overspeed protection and protection against unnecessary temperature induced plant stresses, means for shutting off the flow of

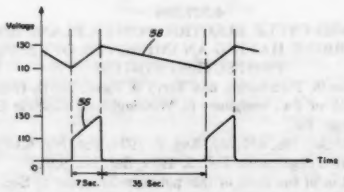
fuel to trip said gas turbine independently of said valve position control means at a turbine speed value above the predetermined reference speed value, a circuit breaker associated with said electric generator, means for sensing the status of said breaker, means for generating a first reference signal corresponding to a first speed value when the plant breaker is open and for generating a second reference signal corresponding to a second reference speed value when the plant breaker is closed, said fuel limit signal generating means responding to the difference between the speed signal and the generated speed reference signal, and the turbine trip speed being higher than both the first and the second reference speed values.

4,327,295

ENERGY CONSERVING DRIVE SYSTEM

Clifford T. Deane, Englewood, Fla., assignor to Electro-Kinetics, Inc., Cream Ridge, N.J.

Filed Sep. 12, 1980, Ser. No. 186,596
Int. Cl.³ H02J *3/30*
U.S. Cl. 290—40 C **5 Claims**



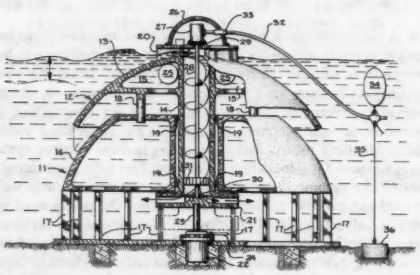
1. An energy conserving drive system, comprising a generator, a drive motor, an energy storing flywheel, battery powered circuit means interconnecting the generator and the motor for energization of the motor operating at a relatively high speed under an operating voltage, switch means connected to the circuit means for intermittently interrupting said energization of the motor, and reduction gear means drivingly interconnecting the motor with the flywheel and the generator for rotation thereof at lower speed than the motor.

4,327,296

WAVE-POWERED MOTOR

Paul F. R. Weyers, Sunnyvale, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Jan. 8, 1981, Ser. No. 223,283
Int. Cl.³ F03B *13/10*; **H02P** *9/04*
U.S. Cl. 290—53 **24 Claims**



1. A method for extracting energy from sea waves, said method comprising the steps of:

(a) positioning station-keeping means beneath the sea;

(b) securing energy conversion means to said station-keeping means, said energy conversion means including:

(i) an atoll member capable of vertical motion relative to said station-keeping means,

(ii) a shaft secured to said atoll member, and

(iii) means for converting energy of successive sea waves impinging on said atoll member into rotational energy of said shaft;

(c) moving said energy conversion means through a range of vertical positions at which said successive sea waves impinge on said atoll member;

(d) measuring energy conversion for said vertical positions in said range to determine a position at which conversion of energy from said impinging sea wave to rotational energy of said shaft is maximum for a particular set of sea state and tidal conditions;

(e) maintaining said energy conversion means at said position of maximum energy conversion for said particular set of conditions as long as said conditions remain substantially unchanged;

(f) moving said energy conversion means through other vertical positions in said range when new sea state conditions occur;

(g) measuring energy conversion for said other vertical positions to determine a new position at which conversion of energy from said impinging sea waves to rotational energy of said shaft is maximum for said new sea state conditions; and

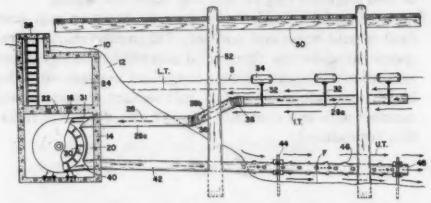
(h) maintaining said energy conversion means at said new position of maximum energy conversion for said new sea state conditions as long as said new sea state conditions and said tidal conditions remain substantially unchanged.

4,327,297

SYSTEM FOR GENERATING ENERGY FROM TIDAL ACTIVITY

Hubert H. Harrison, 132 Richardson Dr., Mill Valley, Calif. 94941

Filed Jan. 19, 1981, Ser. No. 226,066
Int. Cl.³ F03B *13/12*
U.S. Cl. 290—53 **4 Claims**



1. A tide-driven generator comprising:

an on-shore power station;

an inlet conduit extending from a predetermined depth below the zone of surface wave action of a body of sea water to said station;

means for maintaining said inlet conduit at said predetermined depth;

a discharge conduit extending from said station, along the ocean bed to open into said body of sea water adjacent the ocean bed; and

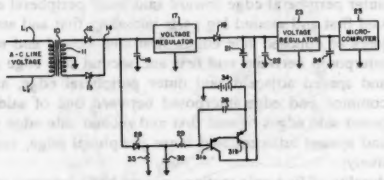
a prime mover at said station connected between said inlet and discharge conduit to be driven by flow of sea water therethrough.

4,327,298

BATTERY BACKUP SYSTEM FOR A MICROCOMPUTER

Albert J. Burgin, Dryden, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 14, 1979, Ser. No. 103,635
Int. Cl.[3] H02J 9/06; G06F 1/00
U.S. Cl. 307—66 3 Claims



1. A power supply system for providing uninterrupted d-c power for a microcomputer, comprising:

a source of a-c line voltage;

a full-wave rectifier coupled to said line voltage source for developing rectified a-c voltage normally having an amplitude exceeding a predetermined threshold level;

a voltage regulator coupled to the output of said full-wave rectifier for producing, from the rectified a-c voltage, a regulated d-c operating voltage having a relatively constant amplitude, the operation of said voltage regulator exhibiting a finite time delay before a change in input voltage results in an output voltage change;

coupling means for coupling the output of said voltage regulator to the microcomputer to normally effect energization of the microcomputer in response to the regulated d-c operating voltage;

a battery;

a normally-off PNP darlington transistor pair having base, emitter and collector terminals;

means, including the conduction path between the emitter and collector terminals of said PNP darlington transistor pair, for coupling said battery to the microcomputer;

monitoring means for sensing the rectified a-c voltage at the output of the full-wave rectifier, and prior to the application of that voltage to the input of said voltage regulator, to produce a control voltage having an amplitude which is directly proportional to the amplitude of the rectified a-c voltage;

means for applying the control voltage to the base terminal of said PNP darlington transistor pair to immediately turn said transistor pair on in the event that the amplitude of the rectified a-c voltage falls below the predetermined threshold level, whereupon the battery voltage is applied to the microcomputer before the drop in the rectified a-c voltage can manifest in a voltage change at the output of the voltage regulator thereby to maintain continuous uninterrupted operation of the microcomputer;

and a feedback capacitor coupled from the emitter terminal to the base terminal of the darlington transistor pair to facilitate a smooth transition during a switch over from a-c line voltage produced power to battery power.

4,327,299

STEPPING MOTOR

Bernardus H. A. Goddijn, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 21, 1980, Ser. No. 152,079
Claims priority, application Netherlands, Jun. 20, 1979, 7904816
Int. Cl.[3] H02K 37/00
U.S. Cl. 310—49 R 4 Claims

1. A stepping motor having a stator (2) which at least comprises a first annular stator section (3) with an annular coil (8) and a magnetically conductive enclosure (6) surrounding said annular coil, which enclosure terminates in the first (10) and second (11) annular system of teeth,

a second annular stator section (4) with an annular coil (9) and a magnetically conductive enclosure (7) surrounding said annular coil, which enclosure terminates in a third (12) and fourth (13) annular system of teeth, and

an axially magnetized annular permanent-magnetic member (5), which is disposed between the two stator sections coaxially with said stator sections, the second (11) and the third (12) annular system of teeth adjoining said permanent-magnetic member, and

a rotor (2) with a toothing (14, 15, 16, 17) which cooperates with the first, the second, the third, and the fourth system of teeth, the first system of teeth and the second system of teeth mutually making a nominal electromagnetic angle of 180° relative to the rotor toothing, the third and the fourth systems of teeth mutually making a nominal electromagnetic angle of 180° relative to the rotor toothing, the first and the fourth system of teeth mutually making a nominal electromagnetic angle of 90° relative to the rotor toothing,

and the second and the third system of teeth mutually making a nominal electromagnetic angle of 90° relative to the rotor toothing, characterized in that, in order to reduce stepping-angle errors for one specific energization, the geometry of the teeth of the second and the third system of stator teeth (11, 12) in relation to the cooperating teeth (15, 16) of the rotor toothing deviates from the geometry of the teeth of the first and the fourth system of teeth (14, 17) in relation to the cooperating teeth (14, 17) of the rotor toothing, in such a way that the amplitude of the permeance of the air gap between the teeth of the second and the third system of stator teeth (11, 12) and the cooperating rotor toothing (15, 16) as a function of the rotor position is at least 1% smaller than the amplitude of the permeance of the air gap between the teeth of the first and the fourth system of stator teeth (11, 13) and the cooperating rotor toothing (14, 17) as a function of the rotor position, said geometries of the second and the third systems of teeth (11, 12) being identical to each other and said geometries of the first and the fourth systems of teeth also being identical to each other.

4,327,300

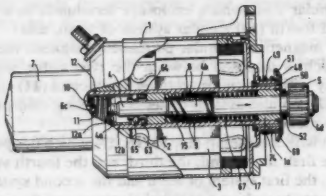
HELICAL SLIDING DRIVE STARTER

Wilhelm Hoven, Grüner Weg 43, D-51 Aachen, Fed. Rep. of Germany

Filed Dec. 12, 1978, Ser. No. 968,683
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1977, 2755704
Int. Cl.[3] F02N 11/00
U.S. Cl. 310—75 C 18 Claims

1. A helical sliding drive starter comprising a freewheel unit having a multiple disc clutch arranged between a starter motor shaft and a pinion shaft, said motor shaft formed with tooth-shaped channels on an interior surface, said pinion shaft formed with tooth-shaped ribs on an exterior surface, certain ones of said discs are provided with outer teeth and certain other ones of said discs are provided with inner teeth, said outer teeth configured to engage said tooth-shaped channels formed in said motor shaft and said inner teeth configured to engage said tooth-shaped ribs on said pinion shaft, said tooth-shaped chan-

nels extend along said starter motor shaft in the form of screw threads, said tooth-shaped ribs extend along said pinion shaft in the form of a sliding screw thread, said discs, said screw



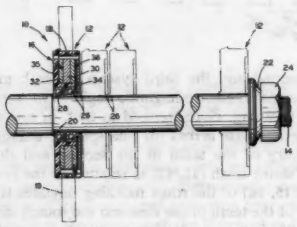
threads, and said sliding screw thread interacting to cause axial engagement and disengagement of said freewheel unit with said motor shaft and said pinion shaft.

4,327,301

MAGNETIC CLUTCH HOUSING

Gunnar H. Janson, Dudley, Mass., assignor to Dana Corporation, Toledo, Ohio

Filed May 12, 1980, Ser. No. 149,062
Int. Cl.³ H02K *49/10*
U.S. Cl. 310—104 **6 Claims**



1. In a housing for a magnetic clutch, said housing defining a circumferential surface thereon for mounting a rotary member, an improvement in said housing comprising a plurality of detents in said mounting surface for axially locating said rotary member on said surface, said detents positioned in clusters, said clusters being circumferentially spaced about said mounting surface, wherein each of said clusters contains at least two axially spaced detents, each detent defining a circumferentially extending protuberance on said mounting surface, each of said detents comprising an integral portion of said mounting surface, each detent defining one end of a plurality of spaced, adjacent, axially extending cantilevered arms, at least two of said arms being joined to radially extending wall portions of said housing, wherein a third arm extends inversely, intermediately and parallel to aforesaid arms from a bridge, said bridge defining an interconnection between the detents of aforesaid arms.

4,327,302

ELECTRONICALLY COMMUTATED MOTOR, STATIONARY AND ROTATABLE ASSEMBLIES THEREFORE, AND LAMINATION

Doran D. Hershberger, Sycamore, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Sep. 21, 1979, Ser. No. 77,784
Int. Cl.³ H02K *21/08*
U.S. Cl. 310—156 **53 Claims**

1. A lamination adapted to be used in a core of a dynamoelectric machine, the lamination comprising:

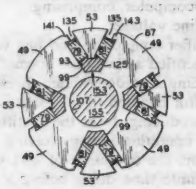
a unitary body of generally thin ferromagnetic material;

an outer peripheral edge of said body;

an inner peripheral edge on said body and spaced generally radially from said outer peripheral edge;

a plurality of generally V-shaped openings through said body between said outer peripheral edge and said inner peripheral edge and disposed with respect to each other generally in arcuate spaced relation about said body, said openings each having first and second leg parts converging toward each other generally in a direction from said outer peripheral edge toward said inner peripheral edge, said first and second leg parts including first and second pairs of opposed side edges, first and second end edges interposed between said first and second side edge pairs and spaced adjacent said outer peripheral edge, and a common end edge interposed between one of said opposed side edges of said first and second side edge pairs and spaced adjacent said inner peripheral edge, respectively;

a plurality of first pole sections on said body between opposite ones of said one opposed side edges of said first and



second side edge pairs in adjacent ones of said openings and extending generally between said outer peripheral edge and said inner peripheral edge, respectively;

a plurality of bridges on said body between said common end edges and said inner peripheral edge and integrally interconnected between adjacent ones of said first pole sections, respectively;

a plurality of second pole sections on said body disposed between the other of said opposed side edges of said first and second side edge pairs and extending from said outer peripheral edge generally toward said inner peripheral edge, said second pole sections including a plurality of free end edges interposed between said other opposed side edges of said first and second side edge pair and spaced from said bridges, respectively; and

a plurality of pairs of bridges on said body between said outer peripheral edge and said first and second end edges of said first and second leg parts and integrally interconnected between said first pole sections and said second pole sections, respectively.

4,327,303

ROTOR ASSEMBLY FOR A DYNAMOELECTRIC MACHINE

Jon E. Jacobsen, Greendale, Wis., assignor to Siemens-Allis, Inc., Atlanta, Ga.

Filed Sep. 29, 1980, Ser. No. 191,912
Int. Cl.³ H02K *1/30*
U.S. Cl. 310—261 **10 Claims**

1. A rotor assembly for a dynamoelectric machine, comprising in combination:

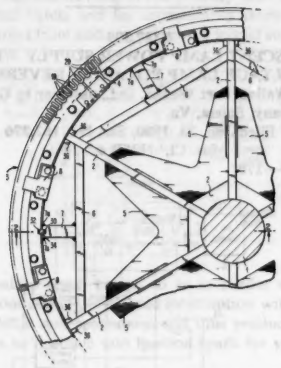
(a) a rotor shaft having an axis of rotation;

(b) a rotor rim structure surrounding said shaft;

(c) a spider connecting said rotor rim structure and said shaft, said spider comprising a plurality of spider arms secured to and extending radially from said shaft;

(d) a plurality of flexible cross beams, each of said cross beams connecting at least two of said spider arms; and

(e) connection means for firmly connecting said cross beams to said rotor rim assembly, said cross beams thereby flex-



ing in an out in radial directions as said rotor rim assembly contracts and expands, respectively.

4,327,304

WINDING FOR SMALL ROTARY ELECTRIC DOUBLE AIR GAP MOTOR

Kanemasa Aoki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed Nov. 16, 1979, Ser. No. 94,787
Claims priority, application Japan, Nov. 25, 1978, 53/145518
Int. Cl.[3] H02K *1/22*
U.S. Cl. 310—266 9 Claims

1. A coil for a coreless motor, comprising:

(a) end connecting wire portions provided on one end face of a cup-shaped coil body open at the other end thereof, each for connecting a first point on the circular periphery of said end face of said coil body with a second point on said periphery through said end face;

(b) first inclined coil wire portions each provided from said second point of said end connecting wire portion to a point on the circular periphery on the other end of said coil body along the generatrix of the cylindrical surface of the coil body; and

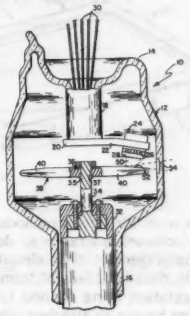
(c) second inclined coil wire portions each provided from said point on the other end of coil body to said second point of said end connecting wire portion along the generatrix of the cylindrical surface of the coil body, wherein said first and second inclined coil wire portions have asymmetric inclination angles.

4,327,305

ROTATABLE X-RAY TARGET HAVING OFF-FOCAL TRACK COATING

Richard G. Weber, Stamford, Conn., assignor to The Machlett Laboratories, Inc., Stamford, Conn.

Continuation of Ser. No. 962,445, Nov. 20, 1978. This application Feb. 15, 1980, Ser. No. 121,859
Int. Cl.[3] H01J *35/08*
U.S. Cl. 313—330 10 Claims



1. An X-ray target of the rotatable type adapted for mounting on a rotor and including:

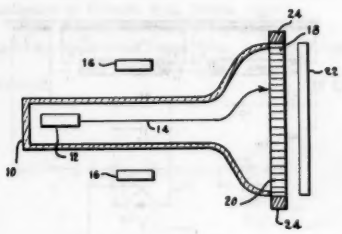
a body having a first surface portion made of X-ray emissive material and a second surface portion made of a heat emissive material comprised of at least ninety-five percent by weight hafnium compound, said compound being at least one of the members from the group consisting of hafnium boride, hafnium oxide, hafnium nitride, hafnium silicide, and hafnium aluminide.

4,327,306

FACE PLATE FOR CATHODE RAY TUBE

Roy F. Stratton, Oriskany, and Edward J. Calucci, Syracuse, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 27, 1979, Ser. No. 97,596
Int. Cl.[3] H01J *31/02, 29/86*
U.S. Cl. 313—419 4 Claims



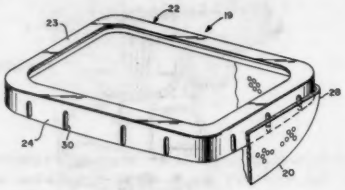
1. In a cathode ray tube having an elongated envelope, an electron gun positioned within said envelope at one end thereof, a face plate adhesively affixed to the other end of said envelope to form an evacuated enclosure, the improvement which comprises a faceplate composed substantially of a plurality of closely packed, electrically conducting boron fibers, each of which consists essentially of a central core of tungsten boride surrounded by a boron sheath, said fibers being positioned in parallel relationship to one another and in which the longitudinal axis of each fiber is coincident to the longitudinal axis of said elongated envelope.

4,327,307

SHADOW MASK FOR COLOR CATHODE RAY TUBE

Carl W. Peaird, Waterloo, and Peter G. Puhak, Seneca Falls, both of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Mar. 19, 1979, Ser. No. 21,744
Int. Cl.[3] H01J 29/07
U.S. Cl. 313—407 3 Claims



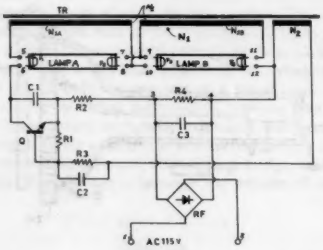
1. A shadow mask for a color cathode ray tube, said shadow mask having increased tolerance to doming caused by heat generated by impingement of an electron beam and comprising: a relatively rigid light weight frame of substantially rectangular configuration being formed to provide an inwardly extending flange having an attached sidewall thereabout and a relatively fragile portion having a curved foraminated face and a solid skirt surrounding said face, a portion of said skirt being formed to provide a substantially rectangular, peripheral, upstanding wall having four sides extending from said face and which upstanding wall telescopes over said sidewall, the improvement comprising: a plurality of spaced projections formed in said frame sidewall, said projections being incapable of movement independent of said frame sidewall and being extruded therefrom, and said fragile portion being attached to said frame by means of welds only between said upstanding wall and said projectons.

4,327,308

SIMPLIFIED POWER SOURCE FOR FLUORESCENT LAMPS

Top-Ping Hwang, and Chin-Liang Feng, both of 13F Wan-Chen Trade Bldg., No. 477 Tung-Hwa South Rd., Taipei, Taiwan

Filed Nov. 13, 1980, Ser. No. 206,678
Int. Cl.[3] H05B 41/29
U.S. Cl. 315—99 4 Claims



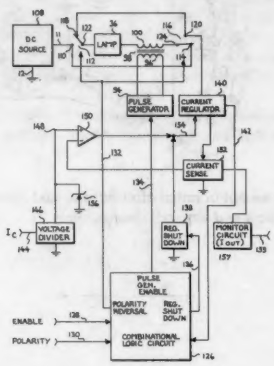
1. A simplified power source for fluorescent lamps comprising an oscillator circuit and a transformer, said transformer comprising a primary winding and a feed-back winding, said oscillator circuit comprising a transistor and being characterized in that the collector of said transistor is connected to one end of said primary winding through a filament of the load lamp and in that the emitter of said transistor is connected through a resistor, one pair of direct-current terminals, one end of said feed-back winding and another filament of the load lamp to another end of said primary winding and in that another end of said feed-back winding is connected to the base of said transistor through a resistor and a capacitor both being connected in parallel.

4,327,309

FLUORESCENT LAMP POWER SUPPLY WITH LOW VOLTAGE LAMP POLARITY REVERSAL

George P. Wallot, Fort Wayne, Ind., assignor to General Electric Company, Salem, Va.

Filed Jun. 23, 1980, Ser. No. 162,276
Int. Cl.[3] H05B 41/14
U.S. Cl. 315—170 12 Claims



1. An electronic ballast circuit for controlling illumination from a gaseous discharge lamp having first and second electrode terminals, comprising:

(a) a source of relatively high voltage power having first and second power output terminals;

(b) normally noninterruptable means connecting said first terminal of said high voltage power source to the first terminal of the lamp;

(c) a d.c. source of relatively low voltage power having first and second power output terminals;

(d) first switching means arranged for selectively connecting the second terminal of the lamp to said first or to second terminal of said DC source;

(e) second switching means arranged for selectively connecting said second terminal of said high voltage power source to said second or to said first terminal of said DC source; and,

(f) means for controlling said first and said second switching means whereby the series combination of the lamp and said high voltage power source are selectively connected in forward or reverse polarity across said DC source.

4,327,310

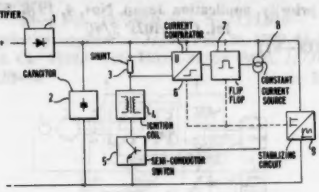
SPARK CIRCUIT

Manfred Jörg, Stadelnerstrasse 18, D-8510 Fuerth, Fed. Rep. of Germany

Filed Feb. 14, 1980, Ser. No. 121,554
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1979, 2906473
Int. Cl.[3] H05B 37/02, 39/04, 41/36
U.S. Cl. 315—209 R 8 Claims

1. A spark circuit for producing an ignition spark for heating equipment comprising a first source of electrical energy, a charging circuit connected with said source and including an ignition coil having a primary winding and a secondary winding, and normally conductive electrically operated switch means connected to interrupt current flow in the primary winding; a second source of electrical energy connected to said switch means for supplying the same with current required to

keep the switch means conductive; and comparator means coupled to said primary winding and operative for comparing the value of current flowing in the primary with a predetermined nominal value, and for momentarily interrupting the supply of current from said second source to said switch means



when said values reach parity, so as to render said switch means non-conductive during said interruption with resulting auto-induction in said secondary, and thus producing a high voltage pulse to produce said ignition spark for said heating equipment.

4,327,311

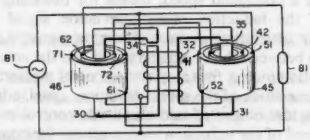
INDUCTOR-CAPACITOR IMPEDANCE DEVICES AND METHOD OF MAKING THE SAME

Theodore Wroblewski, Danvers, Mass., assignor to Frequency, Technology, Inc., Littleton, Mass.

Division of Ser. No. 71,706, Aug. 31, 1979. This application Oct. 6, 1980, Ser. No. 194,371

Int. Cl.³ H01F *15/14*; H05B *41/16*

U.S. Cl. 315—244 **7 Claims**



1. An improved discharge-lamp ballast circuit connected in series with a discharge lamp for regulating the source of power supplied to said discharge-lamp, said ballast circuit including combination inductor-capacitor type windings having input and output spaced foil windings, each of said spaced foil windings having at least one terminal means, said circuit comprising:

first and second magnetically permeable cores for confining the magnetic flux induced therein,

a primary winding magnetically coupled to both said magnetic cores for inducing flux changes therein, said primary winding being connected to said source of power,

a first inductor-capacitor type winding being magnetically coupled with said first magnetic core and having at least one terminal means for each of said respective input and output windings,

a second inductor-capacitor type winding being magnetically coupled with said second magnetic core and having at least one terminal means for each of said respective input and output windings,

the terminal means of the input windings of said first and second inductor-capacitor windings being electrically interconnected to each other through said respective terminal means, and said output windings of said first and second inductor-capacitor being electrically connected to each other through said respective terminal means, and

said output winding of said first inductor-capacitor being adaptable for electrical connection to one terminal of said discharge lamp through one of its terminal means while said input winding of said second inductor-capacitor winding being adaptable for electrical connection with said source of power through one of its terminal means.

4,327,312

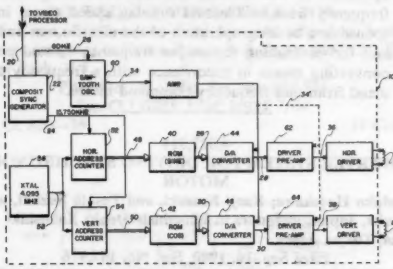
CIRCULAR RASTER SWEEP GENERATOR

Don G. King, 1031 Shadow Wood, Lewisville, Tex. 75067, and Bill B. Bennett, 1101 Lopo Rd., Lewisville, Tex. 75028

Filed Jun. 16, 1980, Ser. No. 159,613

Int. Cl.³ H01J *29/78*

U.S. Cl. 315—378 **8 Claims**



6. A method for driving the horizontal and vertical scanning circuits of a video camera comprising the steps:

generating a horizontal scanning signal characterized by a composite waveform including a constant amplitude component followed by a sine wave component;

generating a vertical scanning signal characterized by a composite waveform including a constant amplitude component followed by a sine wave component which is phase shifted with respect to the sine wave component of the horizontalscanning signal; and,

amplitude modulating the composite horizontal and vertical scanning signals with a sawtooth waveform; and,

applying the amplitude modulated composite scanning signals to the horizontal and vertical scanning circuits, respectively.

4,327,313

CONTROL APPARATUS FOR ELECTRIC CAR

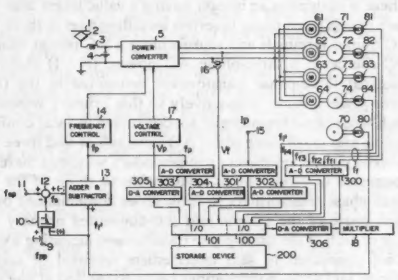
Takashi Tsuboi; Shigetoshi Okamatsu; Masahiko Ibamoto; Hiroshi Narita, all of Katsuta, and Eiji Kozu, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 29, 1980, Ser. No. 125,755

Claims priority, application Japan, Mar. 5, 1979, 54-24485

Int. Cl.³ H02P *5/46*

U.S. Cl. 318—52 **15 Claims**



1. A control apparatus for an electric car having power converting means for converting electric power received from a trolley wire to polyphase AC power of variable frequency, a

driving wheel and an induction motor supplied with said polyphase AC power and coupled to said driving wheel, said control apparatus comprising:

detector means for detecting the actual running speed of the electric car irrespective of whether said driving wheel causes adhesion or non-adhesion;

means for establishing a slip frequency of said induction motor;

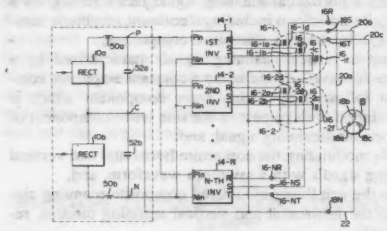
frequency command means for adding said slip frequency to said actual running speed signal in response to powering operation of the electric car and subtracting said slip frequency from said actual running speed signal in response to a braking operation of the electric car; and

means for controlling the output frequency of said power converting means in accordance with a frequency command from said frequency command means.

4,327,314
INVERTER SYSTEM FOR DRIVING SYNCHRONOUS MOTOR

Yasuhiko Hosokawa; Kanji Katsuki, and Toshio Suzuki, all of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1980, Ser. No. 187,976
Claims priority, application Japan, Sep. 19, 1979, 54-120963
Int. Cl.³ H02P *5/40, 1/26*
U.S. Cl. 318—722 **3 Claims**

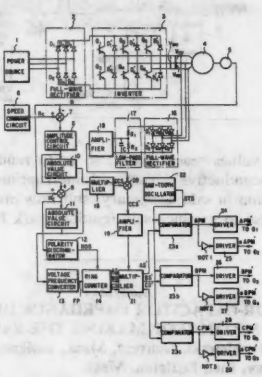


1. An inverter system for driving a synchronous motor, comprising a synchronous motor including star-connected phase windings and a set of three-phase AC input terminals and a neutral terminal, a DC source including a positive terminal, a negative terminal and an intermediate terminal for deriving an intermediate voltage lying between voltages at the positive and negative terminals, the intermediate terminal being connected to said neutral terminal of said synchronous motor, N three-phase inverters connected in parallel circuit relationship across said positive and negative terminals of said DC source where N designates an integer having a value larger than unity, each of said three-phase inverters including a set of three-phase AC output terminals and transforming a DC power from said DC source to a three-phase AC power, (N−1) electrically insulated three-phase transformers connected to the (N−1) three-phase inverter respectively so that primary windings of each three-phase transformer are connected in a star configuration to said set of three-phase AC terminals of said three-phase inverter connected thereto and secondary windings thereof are connected in series circuit relationship to those of the other three-phase transformers to form series combinations one for each phase of the system, said star-connected primary windings of each of the three-phase transformers including a neutral point connected to said intermediate terminal of said DC source, said series combinations being connected at one end to said set of three-phase AC input terminals of said synchronous motor and at the other ends to said set of three-phase AC output terminals of the three-phase inverter not connected to the three-phase transformer.

4,327,315
INDUCTION MOTOR DRIVE APPARATUS

Shigeki Kawada, Hino; Hiroshi Ishida, Hamura, and Yutaka Koiwai, Tokyo, all of Japan, assignors to Fujitsu Fanuc Limited, Hino, Japan

Filed Oct. 31, 1979, Ser. No. 89,739
Claims priority, application Japan, Nov. 4, 1978, 53-136069
Int. Cl.³ H02P *5/40*
U.S. Cl. 318—811 **2 Claims**

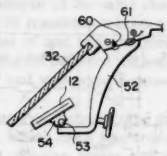


1. An induction motor drive apparatus which includes an inverter for converting DC voltage into three-phase AC voltage, an induction motor driven by the three-phase AC voltage, speed command means for instructing that the induction motor rotates at a command speed, means for detecting the actual speed of the induction motor, deviation signal generating means for generating a speed deviation signal based on the deviation between the command speed and the actual speed of the induction motor, first amplitude control means for controlling the amplitude of the speed deviation signal, adding means for adding the output of said amplitude control means to the actual speed of the induction motor, means for controlling the effective value and the frequency of the three-phase AC voltage applied to the induction motor, on the basis of the output of the adding means, the actual speed of the induction motor being made to coincide with the command speed by controlling the frequency and effective value of the three-phase AC voltage, said means for controlling the effective value and the frequency of the three-phase AC voltage comprising; rectangular wave signal generating means for producing three-phase rectangular wave signals of a frequency in accordance with the output value of said adding means; pulse width modulating means for modulating the pulse width of the rectangular wave signal of each of the three phases; second amplitude control means for controlling the amplitude of the rectangular wave signal of each of the three phases, on the basis of the speed deviation signal and the output signal of said adding means, the amplitude-controlled rectangular wave signals being modulated in pulse width by said pulse width modulating means to provide pulse-width modulated signals, said inverter being controlled on the basis of said pulse-width modulated signals thereby to control the effective value and the frequency of the three-phase AC voltage, said second amplitude control means includes first multiplying means for multiplying together the speed deviation signal and the output of the adding means, the amplitude of the rectangular wave signals being controlled on the basis of the output of said first multiplying means, and the amplitude-controlled rectangular wave signals being modulated in pulse width by said pulse width modulating means, and said second amplitude control means further including second multiplying means for multiplying the three-phase rectangular wave signal by the output of said first multiplying means to control the amplitude of the three-phase rectangular wave signal.

4,327,316
BATTERY RECHARGING SOLAR CELL ARRANGEMENT FOR AN AUTOMOTIVE VEHICLE

Yoshitake Fujikubo, Zushi, and Mamoru Tanaka, Hachioji, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 11, 1980, Ser. No. 120,030
Claims priority, application Japan, Feb. 26, 1979, 54-22913[U]
Int. Cl.³ H02J 7/00; H01L 31/04; B60L 11/18
U.S. Cl. 320—2 **11 Claims**

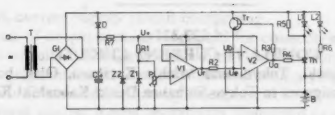


1. An apparatus for recharging an automotive vehicle battery provided in an automotive vehicle comprising:
a first solar battery being secured on a rear view mirror support provided inside of a vehicle compartment adjacent a front windshield, a universal joint means interpositioned between said rear view mirror support and said solar battery for permitting adjustment of direction of said solar battery toward sunlight; and
a recharging current control means for feeding recharging current obtained from said solar battery to said vehicle battery.

4,327,317
APPARATUS FOR CHARGING A RECHARGEABLE BATTERY

Helmut A. Heine, and Otto H. Schmidt, both of Herrsching, Fed. Rep. of Germany, assignors to Propper Manufacturing Co., Inc., New York, N.Y. and Optotechnik GmbH & Co. KG Heine, Fed. Rep. of Germany

Filed Jan. 21, 1980, Ser. No. 113,680
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1979, 2902894
Int. Cl.³ H02J 7/10
U.S. Cl. 320—23 **1 Claim**

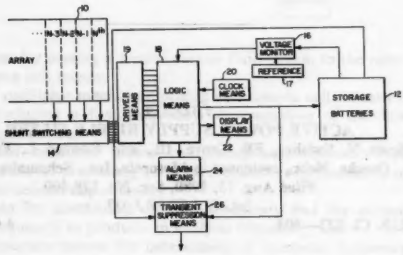


1. A charging apparatus for charging a rechargeable battery when placed in contact therewith, comprising: monitoring means for monitoring the voltage of a rechargeable battery when said battery is placed in contact with said charging apparatus, operational amplifier comparing means comprising a positive feedback operational amplifier having an inverting input communicating with said rechargeable battery and a direct input communicating with a source for generating a reference voltage for comparing the monitored battery voltage to a charged reference voltage and a depleted reference voltage, charging means for charging said battery to substantially said charged reference voltage, maintaining means for maintaining said battery at substantially the monitored battery voltage, control means responsive to said comparing means to connect said battery to said charging means when the monitored battery voltage is less than or substantially equal to the depleted reference voltage so as to charge said battery to substantially said charged reference voltage and then connect said battery to said maintaining means until the monitored battery voltage is again less than or substantially equal to said depleted reference voltage, and switching means responsive to the output of said operational amplifier to control said comparing means to be operative in the absence of a charging voltage from said charging means, said switching means comprising a transistor connected between the output of said positive feedback operational amplifier and the direct input of said operational amplifier.

4,327,318
SOURCE SHEDDING REGULATOR

Yiduk Kwon, Bedford, and Paul Lawson, Hopedale, both of Mass., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 31, 1980, Ser. No. 202,544
Int. Cl.³ G05F 1/46; H02J 7/04
U.S. Cl. 320—39 **14 Claims**



1. A voltage regulator system for controlling photovoltaic charging of rechargeable storage batteries, said system comprising:
an array of photovoltaic solar cells having x number of serially connected solar cells coupled in first through nth parallel connected strings, each said string having blocking diode means connected in series with each of said strings, coupled between said string and said storage batteries;
voltage monitor means responsive to a voltage across said storage batteries, said monitor providing first, second, third and fourth control signals corresponding to monitored battery voltages of
a. greater than or equal to V_{normal};
b. less than or equal to V_{normal};
c. greater than or equal to $V_{maximum}$; and
d. less than or equal to $V_{minimum}$, respectively;
logic means, coupled to receive said first through third control signals, wherein response to said first control signal said logic means provides a first logic signal to initiate a sequential shedding of first through nth strings of said array, said first logic signal continuing until said monitoring battery voltage is less than about V_{normal}; and
in response to said second control signal, said logic means provides a second level signal to initiate sequential reinserting of array strings, said second logic signal continuing until the monitored battery voltage equals or exceeds V_{normal}; and
in response to said third signal continuing for a predetermined time period RC, said logic means provides a third logic signal to initiate simultaneous shedding of first through nth array, strings, said third logic signal continuing until said monitored battery voltage is less than $V_{maximum}$;
in response to said fourth signal continuing for a predetermined time period RC, said logic means provides a fourth logic signal to initiate simultaneous reinserting of first through nth array, strings, said fourth logic signal continu-

ing until said monitored battery voltage is greater than $V_{minimum}$;

switching means for each of said first through nth strings of said array, said switching means having a main current conduction path coupled to electrically disable each respective array string;

sequencing and driver means for providing sequential turn-on or turn-off signals to said first through th switching means, said sequencing means being responsive to said first logic signal to provide sequential turn-on signals to said switching means and responsive to said second logic signal to provide sequented turn-off signals to said switching means;

override and driver means for providing simultaneous turn on or turn off signals of first through nth switching means, said override being responsive to said third and fourth logic signals, respectively.

4,327,319

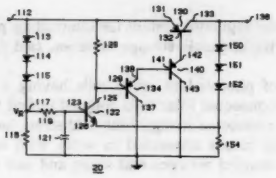
ACTIVE POWER SUPPLY RIPPLE FILTER

Scott N. Swisher, Elk Grove, Ill., and Edward L. Furman, Omaha, Nebr., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 15, 1980, Ser. No. 178,490

Int. Cl.³ G05F 5/00

U.S. Cl. 323—303 **4 Claims**



1. A low noise electronic power supply filter circuit capable of high output currents for eliminating alternating current components from a direct current power supply and for tracking the direct current voltage of said power supply, comprising:

(a) control means having a control terminal, an input terminal and an output terminal, said input terminal coupled to the power supply and said output terminals adapted to be coupled to a load, said control means controlling current from the input terminal to the output terminal;

(b) reference means, coupled to the control means input terminal for generating a reference voltage which tracks approximately three diode drops below the power supply voltage;

(c) amplifier means having an output coupled to the control terminal and having first and second input terminals, for amplifying a signal applied across the input terminals comprising an input transistor coupled to a darlington pair;

(d) filter means, having an input coupled to the reference means for low pass filtering the reference voltage, and having an output coupled to the first input of the amplifier means thereby coupling the filtered reference voltage to said amplifier means; and

(e) feedback means, coupled from the control means output terminal to the second input of the amplifier means, comprising three diodes in series such that approximately one diode drop is maintained across the control means.

4,327,320

REFERENCE VOLTAGE SOURCE

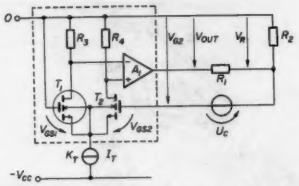
Henri Oguey, Corcelles, and Bernard Gerber, Neuchatel, both of Switzerland, assignors to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed Dec. 19, 1979, Ser. No. 105,117

Claims priority, application Switzerland, Dec. 22, 1978, 13078/78

Int. Cl.³ G05F 1/48

U.S. Cl. 323—313 **7 Claims**



1. A temperature-compensated reference voltage source comprising first and second reference transistors of the same conductivity type, said first reference transistor having its gate at least in part made of polycrystalline silicon the type of doping of which is opposite to that of the drain and source regions of said first transistor, said second reference transistor having its gate made of polycrystalline silicon the type of doping of which is the same as that of the drain and source regions of said second transistor, said reference transistors (T_1, T_2) having their sources connected together and through a current defining element (K_T) to the first terminal ($-V_{CC}$) of a voltage supply source, the drains of said reference transistors being connected each through a resistor element (R_3, R_4) to the second terminal (0) of said supply voltage source and being further connected to a respective input terminal of a differential amplifier (A_1) the output of which is connected to the said second terminal (0), wherein a circuitry (U_C), adapted to generate a compensation voltage increasing with temperature, is connected between the gate of said second reference transistor and the output terminal of said differential amplifier, said compensation voltage being thus subtracted from the potential difference between the gate of said second reference transistor and the second terminal (0) of said supply voltage source, to render the reference voltage (V_R) independent of temperature.

4,327,321

CONSTANT CURRENT CIRCUIT

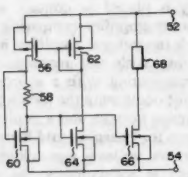
Hiroaki Suzuki, Tokyo, and Michio Kurihara, Oita, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 11, 1980, Ser. No. 158,521

Claims priority, application Japan, Jun. 19, 1979, 54-76278

Int. Cl.³ G05F 3/08

U.S. Cl. 323—315 **16 Claims**



1. A constant current circuit comprising:

first and second power source terminals;

first and second MOS transistors of different channel types connected to said first and second power source terminals,

respectively, and having current paths which are connected in series between said first and second power source terminals;

a third MOS transistor of the same channel type as that of said first MOS transistor, which is connected to said first power source terminal and said first MOS transistor to form constant current means in cooperation therewith;

resistive means connected at the first terminal to said first power source terminal through the current path of said third MOS transistor, and at the second terminal to the gate of said second MOS transistor;

a fourth MOS transistor of the same channel type as that of said second MOS transistor whose gate is connected to said first terminal of said resistive means and whose current path is connected between the second terminal of said resistive means and said second power source terminal; and

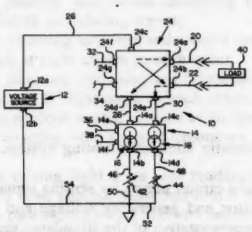
a fifth MOS transistor of the same type as that of said second MOS transistor, which has a gate connected to the second terminal of said resistive means and a current path connected in series with a load to which a constant current is to be supplied.

4,327,322

BIDIRECTIONAL CURRENT SUPPLY CIRCUIT

Tex N. Yukl, Banks, Oreg., assignor to Spatial Dynamics, Ltd., Beaverton, Oreg.

Filed Oct. 6, 1980, Ser. No. 194,339
Int. Cl.³ A61N *1/36*; G05F *3/02*
U.S. Cl. 323—351 **4 Claims**



1. A current supply circuit comprising

a pair of output terminals adapted for connection to a load,

a controlled changeable-direction current source operatively connected to said terminals for supplying current to a load connected therebetween, and

current control means operatively connected to said source, and therethrough to said terminals, for enabling independent adjusting of the level of current flowing in each of the two possible directions through such load via said terminals.

4,327,323

COMPARATOR APPARATUS AND PROCESS

Starnes E. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 3, 1979, Ser. No. 99,272
Int. Cl.³ G01R *27/26*
U.S. Cl. 324—61 R **23 Claims**

1. Apparatus comprising:

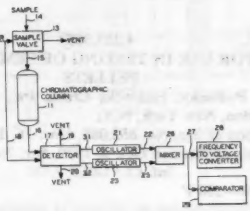
column means for chromatographically separating sample constituents to produce an eluate stream;

means for passing a first carrier fluid stream to the column means;

means for injecting sample constituents into the first carrier fluid stream being passed to the column means;

dielectric constant detector means including sample cell means having a first capacitance representative of a fluid passing therethrough and reference cell means having a second capacitance representative of a fluid passing therethrough;

means for passing the eluate stream through the sample cell means;



means for passing a second carrier fluid stream to the reference cell means;

first oscillator means comprising said sample cell means for producing a first frequency representative of the first capacitance;

second oscillator means comprising said reference cell means for producing a second frequency representative of the second capacitance;

means for combining the first frequency and the second frequency to produce an analysis frequency; and

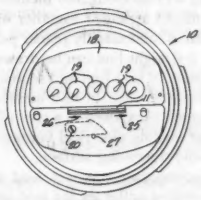
comparator means for determining a threshold frequency and for producing a sensible signal representative of a difference between the threshold frequency and the analysis frequency.

4,327,324

ANTI-THEFT ELECTRIC METER

Ronald C. Welz, Cerritos, Calif., assignor to Southern California Edison Company, Rosemead, Calif.

Filed May 6, 1980, Ser. No. 147,198
Int. Cl.³ G01R *11/24*, *11/02*; B60T *7/12*
U.S. Cl. 324—110 **10 Claims**



1. In a watthour meter including a metering movement adapted to rotate in response to the flow of energy in a pair of line conductors connected to terminals from the meter, reverse connection of the conductors with the terminals causing reverse rotation of the metering movement, forward rotation of the movement occurring on upright mounting of the meter, and reverse rotation occurring on inverse mounting of the

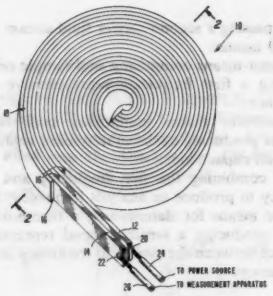
meter, the improvement comprising a gravity responsive stop element adapted to be spaced from the metering movement when the meter is connected forwardly with the line conductors, and adapted to contact the metering movement when the meter is reversibly connected with the line conductors for preventing reverse rotation of the metering movement.

4,327,325

CHUCK FOR USE IN TESTING OF SEMICONDUCTOR PELLETS

Joseph P. Pudlosky, Hunlocks Creek, Pa., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 852,085, Nov. 16, 1977, abandoned.
This application Oct. 2, 1979, Ser. No. 81,194
Int. Cl.³ G01R *1/06*
U.S. Cl. 324—158 F **12 Claims**



1. A chuck for use in testing semiconductor pellets, said chuck comprising:

a first electrically conductive elongated member having a length, said first elongated member having a cross-section which is substantially uniform along substantially the entire length of said first member;

a second electrically conductive elongated member having a length, said second elongated member having a cross-section which is substantially uniform along substantially the entire length of said second member;

electrical isolation means electrically isolating said first and second elongated members from each other and for isolating adjacent portions of each of said first and second members;

said first and second elongated members and said electrical isolation means arranged together in a lapped configuration to form a substantially planar pellet receiving surface such that a straight line can be drawn thereon which will intersect each of said first and second elongated members more than once, each of said members having a contact portion which is exposed as a part of said pellet receiving surface for making electrical contact with a pellet placed on said pellet receiving surface;

means for connecting a power lead to said first member whereby during pellet testing said contact portion of said first members constitutes an input power contact to said chuck and said means for connecting a power lead constitutes an output power contact from said chuck; and

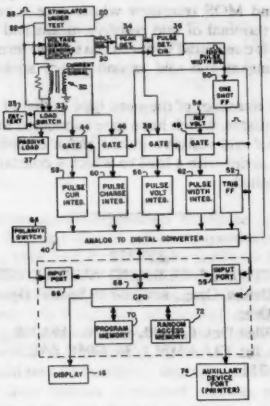
means for connecting a sensing lead to said second member whereby during pellet testing said contact portion of said second member constitutes an input sensing contact to said chuck and said means for connecting a sensing lead constitutes an output sensing contact from said chuck.

4,327,326

AUTOMATIC TESTING SYSTEM FOR ELECTRIC NERVE STIMULATOR UNITS

George J. Frye, Portland, Oreg., assignor to Frye Electronics, Inc., Tigard, Oreg.

Filed May 16, 1980, Ser. No. 150,332
Int. Cl.³ G01R *31/00, 11/00*
U.S. Cl. 324—158 R **17 Claims**



1. An automatic stimulator testing system, comprising in combination:

signal sensing circuit means for sensing signals generated by a stimulator and generating voltage and current output signals representative of the stimulator generated signals;

gate means for receiving said voltage and current output signals;

peak detector means for receiving said voltage output signals and generating output signals equal to the peak voltage of said voltage output signals;

detection circuit means for receiving said output signals from said peak detector means and said voltage output signals from said signal sensing circuit means, said detection circuit means generating output pulses in the form of gate driving signals corresponding to the width of said voltage output signals and transmitting said gate driving signals to said gate means;

integrator means connected to said gate means for receiving said voltage and current output signals when said gate means are operated by said gate driving signals, said integrator means generating converter signals representative of the average of said voltage and current output signals during the time said gate driving signals are present;

analog to digital converter means for receiving said converter signals and said output signals from said peak detector means, all of said signals being converted into digital signals thereby;

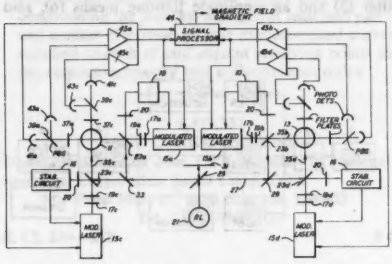
digital computer means for receiving said digital signals, for controlling said integrator means and said peak detector means and for processing said digital signals; and

display means connected to said digital computer means for displaying information of the stimulator generated signals.

4,327,327
ALL-ANGLE GRADIENT MAGNETOMETER

Ivan A. Greenwood, Stamford, Conn., and James H. Simpson, Katonah, N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Jun. 5, 1980, Ser. No. 156,709
Int. Cl.[3] G01N 27/00
U.S. Cl. 324—304 14 Claims



1. An all angle gradient magnetometer comprising:

(a) first and second magnetic resonance cells containing an element adapted for optically pumped and optically readout magnetic resonance rigidly mounted to a common base and separated by a predetermined distance;

(b) means for generating circularly polarized first, second, third and fourth modulated beams of optical radiation at an optical pumping frequency coacting with the said resonance element, said means accepting first, second, third and fourth modulating inputs;

(c) means for directing said first and second beams through said first cell at right angles to each other;

(d) means for directing said third and fourth beams through said second cell at right angle to each other;

(e) a common readout source of light at an optical readout frequency coacting with the said resonance element frequency;

(f) means for mixing light from said readout source with each of said first, second, third and fourth beams before said beams pass through said first and second cells;

(g) means to simultaneously reject light at the pumping frequency and to detect the light from the readout source in each of said beams after passing through said cells and to provide modulating inputs to said means for generating.

(h) signal processing means receiving inputs from said means to detect and providing the magnetic field gradient as an output.

4,327,328
PROGRAMMABLE TIMING CIRCUIT

Malcolm F. MacDonald, Chelmsford, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 10, 1980, Ser. No. 129,132
Int. Cl.[3] H03K 5/159
U.S. Cl. 328—55 3 Claims

1. Apparatus for providing a timed delayed signal comprising:

an oscillator for providing signals at a constant frequency;

a multi-stage binary frequency divider;

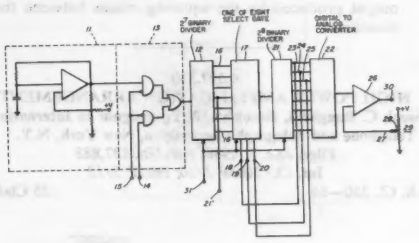
switching means for coupling said signals from said oscillator to an input of said frequency divider;

means for selecting an output from one of said stages of said frequency divider;

a multiple-stage binary frequency divider responsive to the selected output for providing a binary coded digital signal in parallel on output lines therefrom corresponding in number to the number of stages of said multiple-stage binary frequency divider;

a digital to analog converter responsive to said binary coded digital signal for providing an analog output therefrom;

a potentiometer adapted to be coupled across a voltage source for producing a variable voltage from a contact member therefrom;



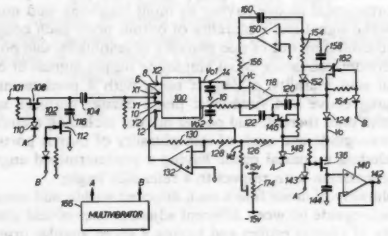
a comparator adapted to provide an output signal therefrom when said analog output is at least equal to said variable voltage; and

means responsive to at least a portion of said binary coded digital signal for controlling said selecting means.

4,327,329
ELECTRICAL SIGNAL PROCESSING

Derek F. Papworth, Wokingham, England, assignor to Racal-Dana Instruments Limited, Bracknell, England

Filed Dec. 10, 1979, Ser. No. 101,585
Claims priority, application United Kingdom, Dec. 9, 1978, 47874/78
Int. Cl.[3] G06G 7/00, 7/12
U.S. Cl. 328—144 15 Claims



1. An electrical circuit arrangement responsive to an input signal for producing an output signal dependent on its root mean square value, comprising

squaring means responsive to the input signal for producing a squared signal proportional to the square of the input signal,

averaging means connected to receive the squared signal to produce an average signal proportional to the mean of the squared signal,

means connected to receive the average signal to take the square root of the average signal to produce the said output signal,

switching means operative at spaced time instants to disconnect the input signal from the input of the squaring means and to maintain it disconnected each time for a predetermined duration,

feedback means connected to the output of the squaring means and operative when the input signal is disconnected from the input of the squaring means to produce a feedback signal of such polarity and magnitude as substantially to null any output produced by the squaring means during that predetermined duration,

storage means connected to receive the feedback signal during each said predetermined duration and to store it from the end of that duration until the next following predetermined duration, and

means connected to apply the stored feedback signal to the output of the squaring means between those said predetermined durations so as to tend to continue to offset any output produced by the squaring means between those durations.

4,327,330

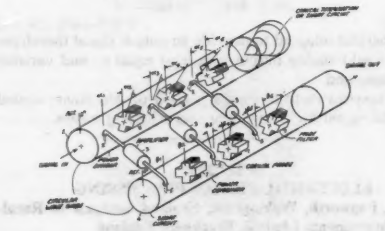
HIGH POWER AMPLIFICATION ARRANGEMENT

Joseph C. Ranghelli, Brooklyn, N.Y., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 7, 1980, Ser. No. 137,883

Int. Cl.³ H03F *3/60;* H01P *5/12*

U.S. Cl. 330—56 **35 Claims**



1. An arrangement to provide high power amplification of a microwave signal comprising:

a plurality of amplifiers;

a first means capable of propagating therein two independent orthogonal modes, said first means including a power divider capable of propagating therein two independent orthogonal modes having an input receiving said microwave signal and a plurality of output ports each coupled to a different one of said plurality of amplifiers, said power divider providing equal amplitude output signals at each of said plurality of output ports with a predetermined progressive and systematic phase change between adjacent ones thereof, said power divider including a circular waveguide and each of said plurality of output ports including a coaxial probe having a predetermined angular orientation with respect to a reference angle;

a plurality of mode filters each disposed within said circular waveguide between different adjacent ones of said plurality of coaxial probes and having a given angular orientation with respect to said reference angle; and

a second means capable of propagating therein two independent orthogonal modes, said second means coupled to said plurality of amplifiers to sum the output signals of each of said plurality of amplifiers to provide at the output of said second means said microwave signal with said high power amplification.

4,327,331

AUDIO AMPLIFIER DEVICE

Toshikazu Yoshimi, Tokorozawa, and Hiroshi Ono, Tokyo, both of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan, a part interest

Filed Nov. 7, 1979, Ser. No. 91,995

Int. Cl.³ H03F *3/68;* H03G *11/04*

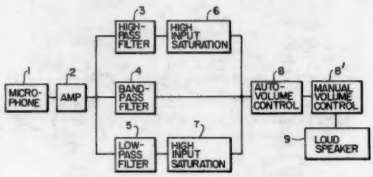
U.S. Cl. 330—126 **6 Claims**

1. An audio amplifier device comprising:

a first transducer means (1) for transducing an acoustic signal into an electric signal;

a first channel means (5, 7) having an input connected to an output of said first transducer means, said first channel means being adapted to pass and amplify a low frequency component of the electric signal while providing an output signal proportional to an input signal when the level thereof is low, and providing a saturated output signal when said input signal is above a predetermined level;

a second channel means having an input connected to said output of said first transducer means, said second channel means being adapted to pass the remaining component of the electric signal and comprising a band pass filter (4) adapted to pass a middle frequency component of said remaining component, and at least one set of a high pass filter (3) and an amplitude limiting means (6), said set



being connected in parallel with said band pass filter, said high pass filter being adapted to pass a component of said remaining component which is higher in frequency than said middle frequency component;

a signal combining and restricting means (8) having an input connected to outputs of said first and second channel means for combining and amplifying output signals of said first and second channel means with a variable gain; and

a second transducer means (9) connected to an output of said signal combining and restricting means for transducing an output signal thereof into an acoustic signal.

4,327,332

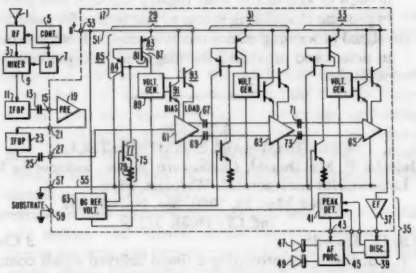
CIRCUIT ARRANGEMENT USEFUL IN DEVELOPING DECOUPLED OPERATING VOLTAGES FOR IF AMPLIFIER STAGES OF AN INTEGRATED CIRCUIT

Max E. Malchow, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 31, 1980, Ser. No. 117,079

Int. Cl.³ H03F *3/45*

U.S. Cl. 330—261 **16 Claims**



1. An integrated circuit constructed on a substrate, comprising:

at least two amplifier stages including respective amplifiers;

coupling means for coupling said amplifiers in cascade;

a power supply line;

a signal ground line;

each of said amplifiers coupled between said power supply line and said signal ground line;

means for applying the a-c potential at said signal ground line to said substrate;

each of said amplifier stages including its own voltage gener-

ating means including a respective receiving current point for developing at lest one operating voltage for the respective one of said amplifier in response to the application of a predetermined current to said current receiving point; and

current supplying means including a lateral transistor arrangement having a separate collector electrode connected to each of said current receiving points, at least one pair of base and emitter electrodes with said emitter electrode connected to said power supply line; and means for conditioning the junction between at least said pair of base and emitter electrodes so that predetermined currents are supplied to each of said current receiving points through the respective ones of said collector electrodes.

4,327,333

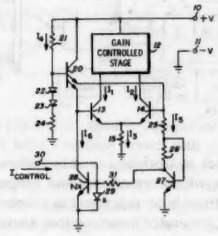
AGC CURRENT SOURCE

Milton E. Wilcox, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 17, 1980, Ser. No. 130,803

Int. Cl.³ H03G *3/10*

U.S. Cl. 330—278 **8 Claims**



1. A circuit for automatic gain control wherein a pair of output currents are varied in opposite directions in response to a control current, said circuit comprising:

differential control stage means having tail current supply means, first and second inputs and providing first and second output currents;

voltage supply means coupled to said first and second inputs;

first current sink means coupled to said first input, said first current sink means including the series combination of a resistor and a conducting transistor;

a current mirror having an output coupled to said second input and an input coupled to a source of control current; said current mirror input being resistor coupled to said conducting transistor, whereby said current mirror acts as a second current sink for said second input variable as a function of said control current.

4,327,334

MULTI-CHANNEL ROTARY JOINT FOR ELECTROMAGNETIC DETECTION EQUIPMENT

Henri Becavin; Alain Bailly, and Philippe Lemerle, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 6, 1980, Ser. No. 147,289

Claims priority, application France, May 11, 1979, 79 11992; Japan, May 10, 1979, 54/57480

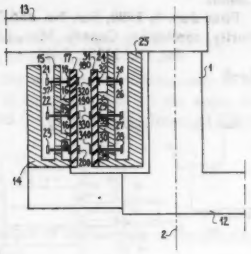
Int. Cl.³ H01P *1/06*

U.S. Cl. 333—1 **5 Claims**

1. A multi-channel rotary joint for coupling a stationary and a rotary component of an electromagnetic detection system to each other, comprising:

a main channel centered on an axis of rotation of said rotary component, said main channel communicating at opposite ends with an input waveguide and an output waveguide; and

a plurality of axially spaced ancillary channels coaxially surrounding said main channel, each of said ancillary channels being constituted by two coplanar concentric rings capacitively coupled to each other, each of said rings comprising two concentric annular conductors divided by angularly equispaced gaps into a multiplicity of closely



spaced arc segments, the gaps of said conductors being relatively offset whereby the arc segments of each ring overlap one another to form an electrically continuous transmission line over substantially a full circle.

4,327,335

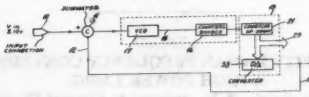
ELECTRONIC LOW-PASS FILTER CIRCUIT WITH AN ADJUSTABLE LONG TIME BASE

Gilles Missout, St-Bruno; Francois Lalonde, Varennes, and Marius Cloutier, Boucherville, all of Canada, assignors to Institut de Recherche de l'Hydro-Quebec, Quebec, Canada

Filed Nov. 19, 1979, Ser. No. 95,520

Int. Cl.³ H03L *7/08*; H04B *15/00*

U.S. Cl. 331—1 A **15 Claims**



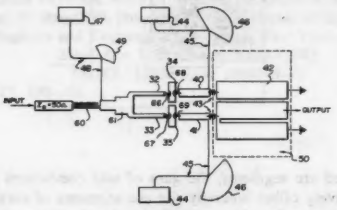
1. A filtering circuit having the behaviour of a low-pass filter capable of having a long time constant, said filtering circuit comprising input circuit means for receiving a voltage input signal to be filtered, a summator circuit for monitoring said input signal relative to a feedback analog output signal from an accumulator means and providing an error signal representative of the difference of said input and output signals of the filtering circuit, said error signal being fed to a voltage controlled oscillator to generate a frequency signal proportional to said error signal, a compensation offset network connected to an input of said oscillator to compensate for non-linearity errors in said oscillator at low voltages in the proximity of 0 volts, said accumulator means having a frequency dividing circuit to divide said frequency signal by a predetermined division factor to control the low cut-off frequency of the filtering circuit whereby to control the response time of the filtering circuit, said accumulator means also integrating said divided frequency signal, and output circuit means to provide an output of said integrated frequency signal to constitute said analog output signal.

4,327,336

MICROWAVE PHASE LOCKED LOOPS USING FET FREQUENCY DIVIDERS

William D. Cornish, and Trevor W. Tucker, both of Nepean, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jun. 5, 1980, Ser. No. 156,583
Claims priority, application Canada, Mar. 13, 1980, 347619
Int. Cl.³ H03L 7/08
U.S. Cl. 331—8 10 Claims



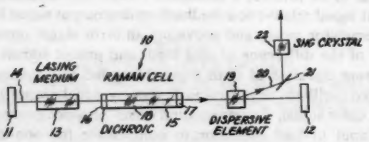
1. A microwave frequency generator comprising a microwave frequency rf oscillator having a control input and having an output forming the output of the microwave frequency generator, a microwave frequency divider having an input connected to receive the output of the rf oscillator and frequency divide it by a factor N and having an output connected to one input of a phase detector, said phase detector having another input connected to receive the output of a reference oscillator and having an output connected to said control input, whereby the rf oscillator produces an rf frequency of N times the frequency of the reference oscillator, said microwave frequency divider comprising at least one MESFET (metal semiconductor field effect transistor) having a gate, a source and a drain, a first transmission line connected to said gate and source and to input terminal means, said transmission line forming, with inherent frequency dependent non-linear capacitance between said gate and source, a resonant circuit at f_o/N, where f_o is the frequency to be applied to said input terminal means, a second transmission line being connected to said source and drain and to output terminal means, whereby said MESFET simultaneously provides parametric frequency division and amplification at microwave frequencies.

4,327,337

INTRACAVITY RAMAN FREQUENCY CONVERSION IN A HIGH POWER LASER

Yung S. Liu, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 3, 1980, Ser. No. 109,359
Int. Cl.³ H01S 3/30
U.S. Cl. 372—3 21 Claims



1. A method for tuning a laser in the visible and infrared range using intracavity Raman conversion comprising the steps of:

exciting a lasing medium to produce a pump beam of coherent electromagnetic radiation oscillating within a laser cavity;

passing said pump beam through a gaseous Raman-active medium disposed in said cavity such that said pump beam passes therethrough a plurality of times, said Raman-active medium scattering a portion of pump beam energy and shifting the frequency of said pump beam by a characteristic frequency of said Raman-active medium to create a Raman beam having a frequency equal to the difference between the frequency of said pump beam and the Raman characteristic frequency of said Raman medium; and

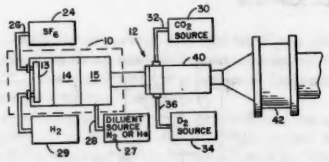
coupling at least part of said Raman beam out of said cavity as an output beam through a dispersive element disposed in said cavity.

4,327,338

NUCLEAR ACTIVATED cw CHEMICAL LASER

Thomas G. Roberts, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 9, 1980, Ser. No. 148,428
Int. Cl.³ H01S 3/095; B01J 19/08
U.S. Cl. 372—89 9 Claims



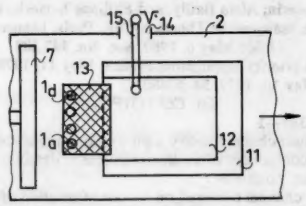
1. A chemical laser comprising: an active atom gas generator chamber having input, intermediate, and output sections for passing gas therethrough; an inactive gas source for supplying inactive gas to said generator input section; a nozzle section for expanding gases from said output section; means for supplying a lasing gas to the gas flow through said nozzle; a lasing chamber attached to the output of said nozzle, an exhaust system for exhausting gases passing through said lasing chamber; and said active gas generator chamber having gas dispersion means within the input section, said intermediate section being a radioactive energy exchanger having passageways therethrough to provide passage for gas into the output section and for affecting said inactive gas to provide an active atom gas output to said nozzle section.

4,327,339

SOLID STATE MICROWAVE SOURCE AND RADIO EQUIPMENT INCORPORATING SUCH A SOURCE

Alain Bert, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 1, 1980, Ser. No. 136,400
Claims priority, application France, Apr. 6, 1979, 79 08790
Int. Cl.³ H03B 9/12
U.S. Cl. 331—107 P 9 Claims



1. A solid state microwave source incorporating a plurality of negative resistance diodes arranged within a transmission waveguide, whose one end is closed by a short-circuiter, com-

prising a system of diodes aligned along one of the wider inner walls of the waveguide and perpendicularly to the transmission direction of the waveguide, at least one quarter wavelength resonant microband line suspended by means of a dielectric substrate placed on the waveguide wall and facing the system of diodes, a very low inductance connection means between the diode system and the resonant line and means for connecting the diode system with a d.c. polarization voltage source.

4,327,340

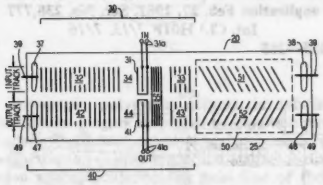
SURFACE WAVE RESONATOR CASCADE

Larry A. Coldren, Holmdel, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 943,681, Sep. 19, 1978, abandoned. This application Sep. 28, 1979, Ser. No. 80,086

Int. Cl.³ H03H *9/64, 3/10, 9/25;* **G02B** *5/14*

U.S. Cl. 333—195 **22 Claims**



1. A grating resonator cascade comprised of

a medium on which surface waves will propagate, and

grating means disposed on said medium for forming first and second grating resonators for said surface waves, said resonators having respective longitudinal axes lying in different wave propagation tracks of said medium,

characterized by means including means external to the cavities of said resonators for coupling a predetermined fraction of resonant wave energy in each resonator out of that resonator along its said axis and into the other resonator along its said axis.

4,327,341

ELECTROMECHANICAL FILTER CELLS

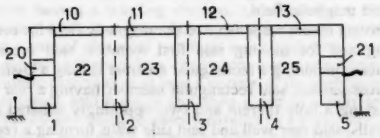
Herbert Ernyei, Conflans-Sainte-Honorine, France, assignor to Lignes Telegraphiques et Telephoniques, Conflans-Sainte-Honorine, France

Filed Jul. 11, 1980, Ser. No. 167,702

Claims priority, application France, Jul. 13, 1979, 79 18221

Int. Cl.³ H03H *9/50, 9/00*

U.S. Cl. 333—197 **1 Claim**



1. An elemental cell for an electromechanical filter having a band of frequencies to be transmitted, comprising:

two parallel cylindrical bars forming longitudinally vibrating resonators; and

a flexurally vibrating cylindrical coupler connected between said two resonators; wherein the diameter (d_c) of said coupler is defined by the expression:

$d_c =$

-continued

$$\sqrt[3]{d_r^2 \cdot \frac{16}{3\pi} \cdot l_c \cdot \frac{\tan\alpha_r^+ (1 - \cos\alpha_c^+ \cosh\alpha_c^+)}{\sqrt{\Omega^+}\ [\sin\alpha_c^+ \sinh\alpha_c^+ + \cos\alpha_c^+ \cosh\alpha_c^+ \pm (\sin\alpha_c^+ + \sinh\alpha_c^+)]}}$$

where:

d_r is the diameter of said resonators

l_c is the length of said coupler

$\Omega^+ = f^+/f_o$ is the upper relative frequency of said band of frequencies to be transmitted, f^+ the upper frequency of said band and f_o the tuning frequency of said resonators

$$\alpha_c^+ = \frac{3\pi}{4} \sqrt{\Omega^+} \cdot \frac{l_c}{l_o}$$

with l_o the length of said coupler corresponding to a quarter wave effect

$$\alpha_r^+ = 2\pi n_r m\Omega^+$$

where m is the order of the vibration mode of said resonators and $n_r = l_r/\lambda_o$ with l_r the length of said resonators and λ_o the wavelength at the tuning frequency of said resonators in longitudinal vibration.

4,327,342

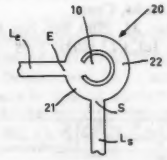
BANDSTOP FILTER FOR VERY HIGH FREQUENCY TRANSMISSION LINES AND BIASSING CIRCUIT FOR A VERY HIGH FREQUENCY TRANSISTOR COMPRISING THIS FILTER

Frans C. De Ronde, Lesigny, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 10, 1980, Ser. No. 168,821

Int. Cl.³ H01P *1/213, 1/203, 3/08*

U.S. Cl. 333—204 **5 Claims**



1. A bandstop filter for very high frequency transmission lines having distributed constants and implemented in a planar structure, more particularly in accordance with the microstrip technique, characterized in that is comprises:

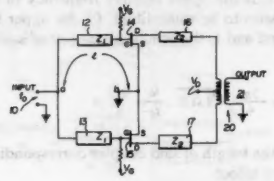
(a) a first filtering element intended to prevent the transmission of a first frequency band and comprised of a quarter-wave filter having an electrical length equal to one quarter of the wavelength λ_1 associated with the center frequency of this first band, arranged at the input point of the bandstop filter and defining there a plane of short circuit,

(b) a second filtering element intended to prevent the transmission of a second frequency band which is adjacent to the first band and comprised of an assembly to two parallel transmission paths which separate at the input point of the bandstop filter and come together again at the output point of this bandstop filter such, that the electrical length of each of these two paths is equal to an odd number of times one quarter of the wavelength λ_2 associated with the center frequency of the second frequency band and that the difference between these lengths is equal to an odd number of times half this wavelength.

4,327,343
WIDEBAND MESFET MICROWAVE FREQUENCY DIVIDER

William D. Cornish, Ottawa, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jun. 10, 1980, Ser. No. 158,594
Claims priority, application Canada, Aug. 28, 1979, 334577
Int. Cl.[3] H01P 1/20; H03H 11/04
U.S. Cl. 333—218 10 Claims

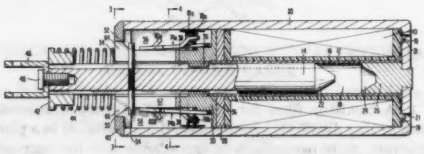


1. A microwave frequency divider comprising at least one MESFET (metal semiconductor field effect transistor) having a gate, a source and a drain, a first transmission line connected to said gate and source and to input terminal means, said transmission line forming, with the inherent frequency dependent non-linear capacitance between said gate and source, a resonant circuit the length of said transmission line being such that said resonant circuit resonates at the subharmonic frequency f_0/N, where f_0 is the frequency to be applied to said input terminal means, said resonant circuit acting to sustain said subharmonic frequency, a second transmission line being connected to said source and drain and to output terminal means, whereby said MESFET simultaneously provides parametric frequency division and amplification at microwave frequencies.

4,327,344
SOLENOID WITH MECHANICALLY LATCHABLE PLUNGER

David Luckenbach, West Haven, Conn., assignor to Hi-G Incorporated, Windsor Locks, Conn.

Filed Mar. 31, 1980, Ser. No. 135,879
Int. Cl.[3] H01F 7/08
U.S. Cl. 335—253 10 Claims

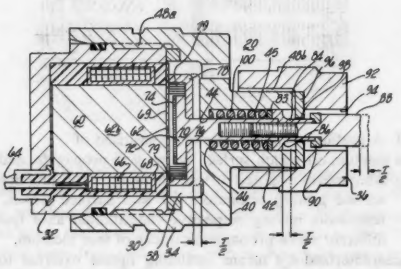


1. A solenoid assembly having a latchable core plunger and comprising:
- a single solenoid coil;
- a single-piece core plunger;
- means for energizing said solenoid coil with an electric current;
- external means normally biasing said plunger to an unretracted position and away from a retracted position;
- a latch pin fixed to the plunger and extending therefrom in a direction transverse to the path of travel of the plunger; and
- mechanical latch means mounted on said solenoid assembly in the path of travel of said latch pin; and
- latch spring means biasing said latch means to an unlatched position such that, when said solenoid coil is initially energized and said plunger is magnetically attracted to said retracted position, said latch pin mechanically engages said latch means and moves it against the bias of said spring means to a latched position where it engages said latch pin and blocks return movement of the plunger to said unretracted position when said solenoid coil is deenergized, and, when said solenoid coil is next energized, the plunger is again attracted in the direction toward said retracted position so that said latch pin moves out of engagement with said latch means to permit said latch means to return to its unlatched position under the force of the spring bias whereby, upon the next de-energization of said solenoid coil, said plunger is returned to its unretracted position by said external means.

4,327,345
SOLENOID HAVING A MULTI-PIECE ARMATURE

Charles R. Kelso, Farmington Hills, and Endre A. Mayer, Birmingham, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 71,914, Sep. 4, 1979, abandoned. This application Feb. 27, 1981, Ser. No. 238,777
Int. Cl.[3] H01F 7/13, 7/16
U.S. Cl. 335—265 7 Claims



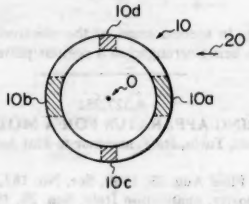
1. A valve responsive to electrical command signals comprising:
- a housing including a first passage extending therethrough and a fluid port adapted to receive fluid in communication therewith;
- magnetic means, disposed within said housing for developing a magnetic field in response to the electric commands input thereto;
- telescoping armature means including a plurality of members disposed within said housing between said magnetic means and said first passage for moving each of said members toward said magnetic means in a telescoping manner in response to said magnetic field, said telescoping armature means comprising:
- a substantially rectangular first member that is responsive to said magnetic field,
- receiving means responsive to the magnetic field for receiving and for moving said first member, said receiving means including a rectangular member having a U-shaped cross-section, said rectangular member having a rear wall having a hole therein and two opposingly situated sidewalls, said rear wall and said side walls forming a receiving cavity therebetween;
- piston means slidably received through said rear wall and operatively connected to said first member and extending through said first passage for reciprocally moving within said first passage in response to the motion of said first member and for opening and closing said fluid first passage to permit fluid flow therethrough;
- biasing means connected to said piston means for biasing said first member absent electric command signals into said receiving means in a spaced relationship relative to said magnetic means.

4,327,346

ANISOTROPIC POLYMERIC MAGNET IN THE TUBULAR FORM AND PROCESS FOR PRODUCING THE SAME

Takeo Tada, Urawa; Katsuji Honda, Yachiyo, and Yoshifumi Hirata, Tokyo, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1980, Ser. No. 121,587
Claims priority, application Japan, Feb. 28, 1979, 54-22036; Feb. 28, 1979, 54-22038
Int. Cl.³ H01F 1/00
U.S. Cl. 335—296 18 Claims



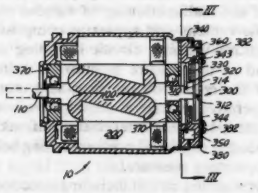
1. An anisotropic polymeric magnet in tubular form, wherein the tubular magnet is formed by injection molding of a mixture of ferromagnetic material and polymeric material, and the magnetization orientation of the magnet is directed in one direction perpendicular to the axial line of the tubular magnet, wherein a weld line or lines are formed at a portion or portions of the tubular magnet such that an imaginary horizontal line connecting said portion or portions with the axis of the tubular magnet is perpendicular to said one direction.

4,327,347

SYNCHRO

Casimer F. Remus, Tunkhannock, Pa., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Apr. 25, 1980, Ser. No. 143,673
Int. Cl.³ H01F 21/06
U.S. Cl. 336—120 8 Claims



8. An electrical apparatus comprising a rotor and a stator, the rotor having a winding thereon, a shaft defining an axis supporting said rotor for rotation relative to said stator and having a pair of electrical terminals associated with the rotor and coupled to the winding, the improvement comprising:

a housing surrounding at least a portion of the shaft-mounted terminals, said housing including a pair of axially-spaced radially-extending recesses separated by a radial insulating portion, each recess associated with an electrical terminal mounted to the housing for receiving a rotor power signal;

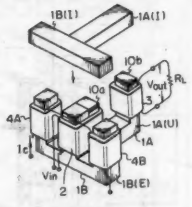
means for coupling the shaft-mounted terminals to the rotor terminals while allowing relative rotation of said rotor, said means including a first and a second spirally-wound hairsprings, each made of electrically conductive material, each of said hairsprings being mounted in a respective recess of said housing and coupling one of said housing mounted terminals to one of said rotor terminals, whereby when the rotor power signal is applied to the housing-mounted terminals, the signal is conducted by said hairsprings to the rotor terminals while the hairsprings allow a rotational movement of said rotor with respect to said stator.

4,327,348

VARIABLE LEAKAGE TRANSFORMER

Hiromitsu Hirayama, Funabashi, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 884,953, Mar. 9, 1978, Pat. No. 4,213,084. This application Oct. 3, 1979, Ser. No. 81,339
Claims priority, application Japan, Oct. 14, 1978, 53-140209[U]; Oct. 14, 1978, 53-140210[U]
Int. Cl.³ H01F 29/00
U.S. Cl. 336—184 6 Claims



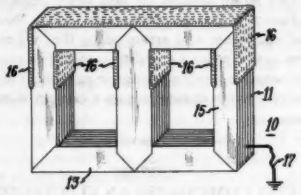
1. A variable leakage transformer comprising of a first closed magnetic path having a U shaped core and an I shaped core, a second closed magnetic path having an E shaped core and an I shaped core, the center leg of said E shaped core being connected to one leg of said U shaped core, a pair of spacers of non-magnetic material inserted between the top of the legs of said U shaped core and the related I shaped core, said U shaped core and the relating I shaped core constituting the main magnetic path and said E shaped core and the relating I shaped core constituting the sub-magnetic core, a primary winding wound common to the center leg of said E shaped core and one leg of said U shaped core, a secondary winding wound on the other leg of said U shaped core, and a pair of control windings wound on the pair of side legs of said E shaped core and being connected in series with each other.

4,327,349

TRANSFORMER CORE HAVING CHARGE DISSIPATION FACILITY

Robert H. Ettinger, Schenectady, N.Y., and Walter J. Pasko, Lee, Mass., assignors to General Electric Company, N.Y.

Filed Mar. 19, 1980, Ser. No. 131,652
Int. Cl.³ H01F 27/24
U.S. Cl. 336—219 7 Claims



1. A transformer core comprising:

at least two legs;

upper and lower yokes joining said legs in a closed magnetic circuit, said legs and yokes each consisting of a plurality of steel laminations arranged in a stack and electrically insulated from each other;

coatings of semiconductor material applied to the exposed edge surfaces of said leg and yoke laminations to accommodate current flow between said laminations; and

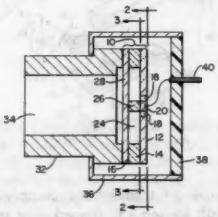
an electrical ground lead connected with at least one of said

core laminations and cooperating with said semiconductor material coatings to provide a current leakage path to ground for excessive electrical charges created on said core laminations as a result of a transformer impulse voltage condition.

4,327,350
PRESSURE TRANSDUCER

Herman W. Erichsen, Medfield, Mass., assignor to Data Instruments, Inc., Lexington, Mass.

Filed Jul. 17, 1979, Ser. No. 58,282
Int. Cl.³ G01L 1/22
U.S. Cl. 338—4 **14 Claims**



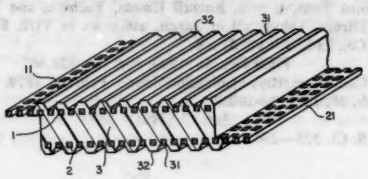
1. A pressure transducer comprising:
a support member;
a first flat sheet of material comprising (a) two apertures arranged so as to form a beam having first and second opposite ends and (b) a margin section which surrounds said apertures and is coextensive with the periphery of said first sheet;
a second flat sheet having (a) an outer margin section coextensive with its periphery and (b) an inner section forming a flexible diaphragm which is surrounded by its said margin section, said second sheet being interposed between said support member and said first sheet so that said beam overlies and is spaced from said diaphragm;
means securing said margin sections of said first and second sheets to said support member so that the ends of said beam are fixed relative to said support member and said diaphragm and beam can flex relative to said support member;
force transmitting means coupling the approximate center of said beam to said diaphragm so that said beam will deflect responsively when said diaphragm is deflected in at least one direction; and
at least two strain sensors on said beam responsive to the deflection of said beam, said sensors being located on one side of said beam and arranged so that when said beam deflects in said at least one direction one of said two strain sensors senses a tension change in said beam and the other of said two strain sensors senses a compression change in said beam.

4,327,351
LAMINATES COMPRISING AN ELECTRODE AND A CONDUCTIVE POLYMER LAYER

Jack M. Walker, Portola Valley, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 41,071, May 21, 1979, Pat. No. 4,272,471. This application Oct. 7, 1980, Ser. No. 194,793
Int. Cl.³ H01C 7/02, 1/14
U.S. Cl. 338—22 R **9 Claims**

1. A laminate comprising a layer of a conductive polyer composition having a substantially constant cross-section and an electrode adherent to said layer, said electrode being in the form of a flat sheet having openings therein, said conductive polymer composition penetrating into but not through said openings in first areas of the electrode and penetrating through

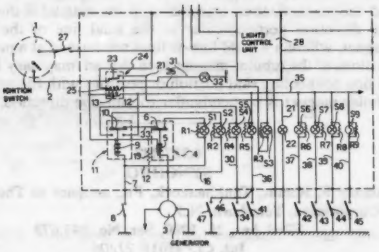


said openings in second areas of the electrode, said first and second areas being arranged in a regular pattern.

4,327,352
MONITORING APPARATUS FOR A MOTOR VEHICLE

Eraldo Cerruti, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Aug. 28, 1980, Ser. No. 182,252
Claims priority, application Italy, Sep. 28, 1979, 68883 A/79
Int. Cl.³ B60Q 1/00
U.S. Cl. 340—52 F **11 Claims**

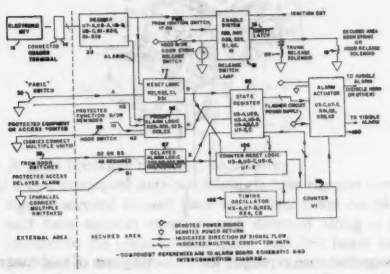


1. In a motor vehicle, monitoring apparatus for providing an indication of the malfunctioning of various components and systems of the vehicle, said apparatus comprising:
an oil-pressure warning circuit including a first warning light and an oil-pressure monitoring switch arranged to monitor the engine oil pressure, said monitoring switch being operative, whenever the oilpressure warning circuit is activated, to cause energization of said first warning light upon the engine oil pressure falling below a predetermined operating pressure,
a generator warning circuit including a second warning light and control means controlling energization of said second warning light, the generator warning circuit being so arranged that when activated the non-operation of the vehicle's generator is indicated by energization of said second warning light,
a first controllable switching device switchable between first and second states in the former of which said device is arranged to activate said oil-pressure warning circuit, the first switching device being controlled by the said control means of the generator warning circuit to be in its first state only during running of the vehicle engine as indicated by the operation of the generator, and
a second controllable switching device switchable between first and second states in the former of which the second switching device is arranged to activate the said generator warning circuit, the second switching device being controlled by said oil-pressure monitoring switch to be in its first state only during running of the vehicle engine as indicated by the presence of said predetermined oil pressure.

4,327,353
SECURITY SYSTEM

George W. Beard, 145 West Canton St., Boston, Mass. 02118, and James M. Mulvaney, Southborough, Mass., assignors to George W. Beard, Boston, Mass.

Continuation of Ser. No. 883,891, Mar. 6, 1978. This application May 9, 1980, Ser. No. 148,547
Int. Cl.[3] B60R *25/04, 25/10*
U.S. Cl. 340—64 2 Claims



1. A security system for a lock-controlled unit, comprising

(a) a reader connector having electrical contacts for connection with a cooperating electronic key,

(b) an electronic key having a plurality of electrically conductive elements defining continuous and discontinuous circuits in a predetermined, uniquely coded arrangement,

(c) a decoder operatively connected to said reader connector and having logical circuitry responsive to said electronic key seated in said reader connector and coding links and diodes connected to said contacts of said connector in a predetermined, uniquely coded arrangement complementary to the coded arrangement on said key whereby an error signal is generated upon connection of a differently coded key to said connector and an enable signal is generated only upon connection of a similarly coded key to said connector,

(d) alarm means operatively associated with said system,

(e) alarm control means operatively connected to said alarm means and to said decoder and responsive to the signals from said decoder whereby said alarm means is actuated by an error signal from said decoder, and,

(f) lock control means operatively connected to said alarm control means for enabling and disabling said lock and responsive to the signals from said decoder,

said key having said conductive elements in the form of spaced parallel strips including a first conducting strip and a second conductive strip and a common transverse strip for engagement with first and second ones of said contacts when said electronic key is seated in said reader connector,

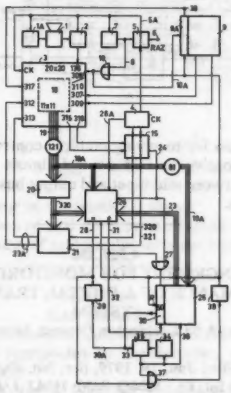
said first and second strips being conductively interconnected by said common transverse strip so that upon mating engagement with said first and second contacts said first and second strips are in a conductive path carrying an input signal to said logical circuitry indicating that said electronic key is seated in said reader connector and comprising means for preventing false error signals during insertion of said electronic key into said reader connector,

said logical circuitry responsive to said input signal for enabling said decoder to provide the appropriate one of said error and enable signals.

4,327,354
LEARNING DEVICE FOR DIGITAL SIGNAL PATTERN RECOGNITION

Eric H. J. Persoon, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1979, Ser. No. 90,806
Claims priority, application Netherlands, Nov. 3, 1978, 7810943
Int. Cl.[3] G06K *9/00*
U.S. Cl. 340—146.3 MA 10 Claims



1. A device for recognizing a pattern of a predetermined number of separate digital signals which are arranged according to at least one coordinate and each of which has a signal value, the device comprising an input with first storage means for receiving and storing said pattern, second storage means with a predetermined number of storage locations, each of which has a storage capacity for a corresponding pattern, a difference determining device with a first input which is connected to a data output of the first storage means, a second input which is connected to a data output of the second storage means, and an output for alternatively supplying a non-correspondence/correspondence signal, characterized in that for the recognition of a local pattern which is selected from a overall pattern by way of a coordinate-wise adjustable window device, the window device comprises a stepping mechanism in order to be adjusted coordinate-wise over a step, a gradient determining device being provided for determining, for predetermined coordinate values within the window, the absolute value of a coordinate-wise gradient of the values of said digital signals prevailing at said coordinate values, a moment generator for receiving said absolute values and for determining a moment thereof with respect to a reference point of the window, and for generating an output signal when a predetermined minimum value of said moment is reached in order to indicate that a local high value is reached of the value of said coordinate-wise gradient averaged over the local pattern, a connection being provided for supplying said output signal as an activation signal to said difference determining device.

4,327,355
DIGITAL DEVICE WITH INTERCONNECT MATRIX

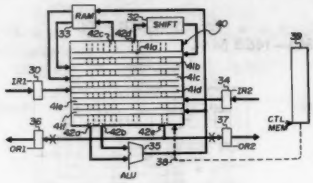
Melvyn E. Genter, San Diego, and Hanan Potash, La Jolla, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 23, 1980, Ser. No. 162,057
Int. Cl.[3] H04Q *3/42;* G06F *7/38*
U.S. Cl. 340—825.9 16 Claims

9. On a semiconductor chip, a programmable interconnect matrix comprised of:

a plurality of multibit input busses and a plurality of multibit output busses for carrying signals thereon;

multiple sets of selectable electrical contacts, each set of contacts defining a set of parallel paths by which respective bits on any desired subset of said input busses pass to corresponding bits on any desired subset of said output busses;



control inputs for receiving multiple control signals; and

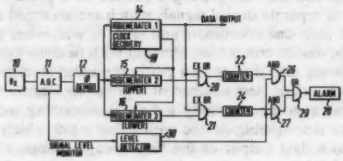
means responsive to said control signals for transferring signals between said input and output busses via any set of said paths.

4,327,356

ARRANGEMENT FOR MONITORING THE PERFORMANCE OF A DIGITAL TRANSMISSION SYSTEM

John D. Gilliland, 63 Lockington Cresent, Stowmarket, Suffolk, England

Filed Jun. 19, 1979, Ser. No. 49,502
Int. Cl.³ H04Q *9/00*; H04J *3/14*
U.S. Cl. 340—825.77 **5 Claims**



1. A monitoring arrangement for monitoring the performance of a digital transmission system based upon characteristics of the eye diagram of a received signal, said system comprising:

three level sensors for sensing, at decision instants, the level of a signal derived from said received signal, a first of the sensors having a threshold corresponding substantially to the center of the eye diagram amplitude, a second of the sensors having a threshold near the upper level of the eye diagram amplitude, and the third of the sensors having a threshold near the lower level of the eye diagram amplitude,

means for producing an alarm signal when the upper or lower eye amplitude level is between the thresholds of the second and third level sensors, and

means for monitoring the level of said received signal to provide a signal to said means for producing for inhibiting said alarm signal when the carrier-to-noise ratio of the received signal falls below a predetermined value.

4,327,357

MAGNETIC INDICATOR ASSEMBLY

Alfred Skrobisch, Commack, N.Y., assignor to The Staver Company, Inc., Bay Shore, N.Y.

Filed Apr. 28, 1980, Ser. No. 144,763
Int. Cl.³ G08B *5/24*
U.S. Cl. 340—373 **10 Claims**

1. A magnetic indicator assembly comprising:

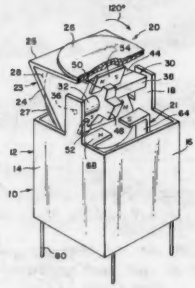
a support;

a rotor angularly rotatable on said support, said rotor comprising:

two indicating flags angularly positioned from each other by an acute angle thereinbetween; and

a permanent bar magnet associated with each of said flags;

a stator in said support, comprising a reversible magnetizable



magnetic core arranged for attracting one of said magnets when said core is magnetized with a particular polarity and wherein said core is comprised of four rectilinear legs which form a rectangle with a gap in one of said legs, said one leg juxtaposed to said rotor and a winding on said core, and wherein each of said magnets is longer than said gap in said one leg.

4,327,358

PHYSICAL DETERRENT BARRIER WITH UPWARD LOOKING DETECTION SENSOR FOR INTRUDER DETECTION SYSTEM

Nicholas V. Karas, Lowell, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 29, 1980, Ser. No. 126,073
Int. Cl.³ G08B *13/18*; H01P *3/10*
U.S. Cl. 340—541 **5 Claims**

1. In an intruder detection system utilizing leaky transmission line sensor means and having a transmitter for transmitting r.f. signals therealong and including a receiver and processing circuits for receiving and processing reflected r.f. signals resulting from intruder violations of said sensor means, the improvement residing in an intruder deterrent barrier and upward looking intruder detection sensor, said deterrent barrier and upward looking intruder detection sensor comprising:

a physical intrusion deterrent barrier,

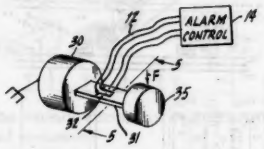
an r.f. corner reflector antenna comprised of a multiplicity of strands of barbed wire and having an aperture, said corner reflector being disposed on the top surface of and coextensive with said barrier, the aperture of said corner reflector antenna being directed upwards, and

a leaky transmission line within and extending along the length of said corner reflector antenna and providing an r.f. signal therefor, said leaky transmission line being operatively connected into said intruder detection system.

4,327,359
GLASS BREAKAGE DETECTORS EMPLOYING PIEZORESISTIVE DEVICES

Anthony D. Kurtz, Englewood, N.J., assignor to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Continuation of Ser. No. 46,263, Jun. 7, 1979, which is a continuation of Ser. No. 829,771, Sep. 1, 1977. This application Aug. 19, 1980, Ser. No. 179,509
Int. Cl.³ G08B *13/04*
U.S. Cl. 340—545 **8 Claims**



4. A glass breakage detector, comprising:

(a) a first cantilever detector having a base support member rigidly secured to said glass and a first beam coupled to said base support member and directed along a plane parallel to the plane of said glass, said first beam having positioned thereon at least one piezoresistive sensor adapted to provide a change in resistance for forces sufficient to deflect said beam upon breakage of said glass,

(b) a second cantilever detector having a base support member rigidly secured to said glass and a second beam coupled to said support member and directed along a plane transverse to the plane of said glass, said second beam having positioned thereon at least one other piezoresistive sensor adapted to provide a change in resistance for forces sufficient to deflect said second beam upon breakage of said glass, and

(c) logic means coupled to said sensors associated with said first and second cantilever detectors to monitor said resistance changes and to provide an alarm when forces sufficient to break said glass are applied to both sensors, whereby said logic means discriminates against typical forces applied to said glass during conventional conditions as when said window is moved conventionally to cause said logic means as coupled to said sensors to inhibit alarm operation.

4,327,360
ALARM DEVICE RESPONSIVE TO MOVEMENT OF PROTECTED OBJECT, POWER SOURCE CONDITION AND ALARM GROUND PATH

E. B. Brown, P.O. Box 9772, Fort Worth, Tex. 76107

Filed Jun. 10, 1980, Ser. No. 158,045
Int. Cl.³ G08B *13/14*
U.S. Cl. 340—571 **16 Claims**

1. An alarm adapted to be mounted on an object to be protected comprising:

first and second terminal signals, one of said first and second terminal signals being ground, the other at a potential with respect thereto;

first means (14) having two states and receiving at least a portion of said first terminal signal when said object remains fixed;

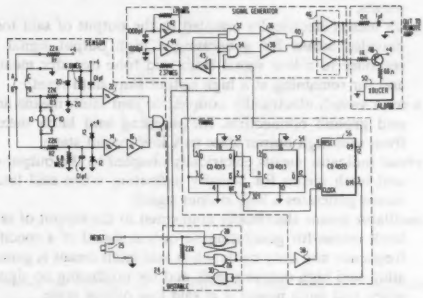
means (10) for applying at least a portion of said second terminal signal to said first means when said object is moved;

second means (22) in parallel with said first means, having two states, and receiving at least a portion of said second terminal signal;

means for applying at least a portion of said second terminal signal to said first means when a connection between said first terminal and said first means is disrupted;

means for applying at least a portion of said first terminal signal to said second means when a connection between said second terminal and said second means is disrupted;

whereby one of said first and second means changes state to signal an alarm to indicate:



(i) a movement of the protected object,

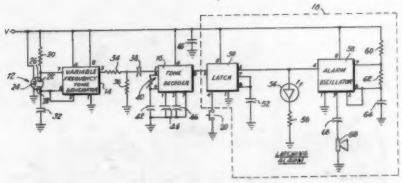
(ii) a disruption of said first terminal signal, or

(iii) a disruption of said second terminal signal.

4,327,361
GAS SENSOR

Howard M. Berlin, Newark, Del., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 6, 1980, Ser. No. 204,444
Int. Cl.³ G08B *17/10*
U.S. Cl. 340—634 **11 Claims**



1. A gas sensor comprising:

sensing means for generating a varying output impedance as a function of the concentration of gases to which it is exposed, said sensing means including heater means for elevating said sensing means to a specific temperature range;

voltage supply means for supplying energy to said heater means;

a first resistor element operatively coupled to a first output terminal of said gas sensing means and to said voltage supply means;

a first capacitor element operatively connected to a second output terminal of said sensing means and to a ground connection;

linear integrated circuit timer means, having input terminal operatively coupled to said first resistor element and to said first capacitor element, said first resistor and capacitor having impedances selected to control the frequency of the output of said linear integrated timer means so that it is in the audio range;

voltage divider means operatively coupled to the output of said timer means for reducing the voltage from the output of said timer means;

a second capacitor electrically coupled to a common junction of said voltage divider means;

tone decoder circuit means having an input terminal electrically AC coupled to said second capacitor;

a variable resistor, electrically coupled to other adjacent input terminals of said tone decoder means;

capacitor means electrically coupled intermediate said ground connection and said variable resistor for cooperating therewith for filtering the input of said tone decoder means;

latch means electrically coupled to the output of said tone decoder means for generating a high output signal in response to a low signal from said tone decoder means, and for remaining at a high output state until reset;

a reset switch electrically coupled to said latch means and said ground connection, for resetting said latch means from said high output state to a low output state;

visual indicator means electrically coupled to the output of said latch means for visually indicating when said latch means generates a high output signal;

oscillator means electrically connected to the output of said latch means for generating an output signal of a specific frequency and duty cycle when said latch means is generating said high output signal, and for producing no signal when said latch means is at said low output state;

means for varying said specific frequency and duty cycle of said oscillator means; and

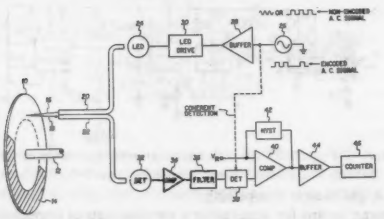
alarm means electrically coupled to the output of said oscillator means for generating a signal when said visual indicator means is responsive to said latch means.

4,327,362

METER ROTOR ROTATION OPTICAL SENSOR

Robert J. Hoss, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 23, 1978, Ser. No. 954,046
Int. Cl.³ G08C *19/36;* G01D *5/36*
U.S. Cl. 340—870.02 **10 Claims**



1. Rotation sensing apparatus for monitoring at a remote location the rotations of a meter rotor having a light reflecting surface except for a circumferentially disposed non-reflecting portion whose arc is less than the meter circumference, comprising:

a light source at the remote location from the meter whose rotor rotations are to be monitored including a transducer for converting electric energy to light and an AC signal source for energizing said transducer;

a first fiber optic bundle for routing the light from said source to the meter to be beamed onto the circumferential section of the surface of the rotor containing the non-reflecting and reflecting portions at it rotates therepast;

a second fiber optic bundle for routing light reflected from the surface of said rotor back to the remote location;

detection means at the remote location, including a transducer for converting the periodic light reflections from the surface of the rotor as it rotates to electrical AC analogs, discrimination means for passing only AC analogs which bear a predetermined relationship to said AC signal source and means for converting the passed AC analogs to electrical pulse analogs, and

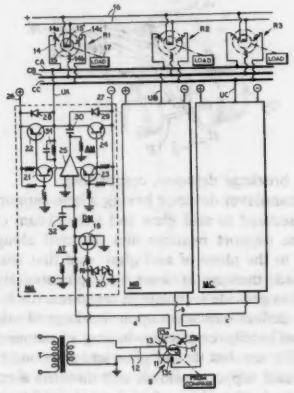
counting means connected to said detection means for accumulating the number of said electrical pulse analogs.

4,327,363

SYSTEM FOR TRANSMITTING HEADING INFORMATION FROM A COMPASS TO SEVERAL FOLLOWERS

Piero M. Derossi, Corso Giovanni Lanza 55, Turin, Italy

Continuation-in-part of Ser. No. 973,807, Dec. 28, 1978, abandoned. This application Jul. 10, 1980, Ser. No. 168,462
Claims priority, application Italy, Dec. 30, 1977, 69955 A/77
Int. Cl.³ G05B *11/12;* G08C *19/06*
U.S. Cl. 340—870.34 **9 Claims**



1. A system for transmitting heading information from a compass to a plurality of followers, comprising:

a synchro transmitter with a stator member and a rotor member, the latter being coupled with a compass for assuming an angular position corresponding to heading information furnished by said compass;

a source of single-phase alternating current connected across a winding on one of said members, the other of said members having three angularly spaced-apart windings;

a-c/d-c conversion means divided into three substantially identical modular units each having an input connection to a respective winding of said other of said members; and

a plurality of synchro receivers each having a stator part and a rotor part, one of said parts having three windings respectively connected to outputs of said modular units, the other of said parts being provided with magnetizing means for setting up a steady magnetic field, said followers being respectively coupled with the rotor parts of said synchro receivers.

4,327,364

APPARATUS FOR CONVERTING INCIDENT MICROWAVE ENERGY TO THERMAL ENERGY

Richard L. Moore, Cleveland, Okla., assignor to Rockwell International Corporation, El Segundo, Calif.

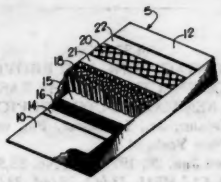
Filed Dec. 22, 1978, Ser. No. 972,195
Int. Cl.³ H01Q *17/00*
U.S. Cl. 343—18 A **8 Claims**

1. In an apparatus for converting incident microwave energy to thermal energy to substantially preclude reflection of the microwave energy, the apparatus having a ground plane sheet and having an electrical component sheet of admittance Y_s, separated from one another by a low dielectric spacer having an admittance Y_1, a phase constant β_1, and a thickness l_1; the improvement wherein said electrical component sheet comprises:

a low dielectric substrate having a coating thereon of a mixture of carbon and resin in a selected ratio and in a selected geometrical pattern, said ratio and said geometri-

cal pattern being selected to result in an admittance Y_s which is substantially defined by the following equation:

$$Y_s = Y_0 + j \cot 2\beta_1 l_1$$

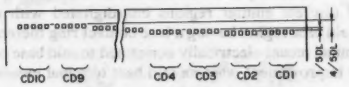


where Y_0 is the intrinsic admittance of the environment in the vicinity of said apparatus.

4,327,365
THERMAL PRINTER

Atsushi Noda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1979, Ser. No. 105,883
Claims priority, application Japan, Dec. 27, 1978, 53-165873
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **1 Claim**



1. A thermal printer comprising:

a thermal head having a plurality of one line dot thermal element groups (N) corresponding to a plurality of characters to be printed in a row or column on a recording medium, wherein said thermal element groups are disposed along a substantially longitudinal direction and are displaced relative to one another by a predetermined pitch perpendicular to said substantially longitudinal direction;

control means for driving the thermal element groups (N) of said thermal head in a time-divided fashion with time-divided signals N; and

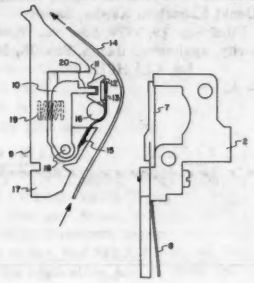
means for changing the relative positional relationship between said recording medium and said thermal head by said predetermined pitch in response to each activation of each of said thermal element groups N by said control means.

4,327,366
FLEXIBLE LOW FRICTION PLATEN COVER FOR RECORDING APPARATUS

William Schafter, Corvallis, and Terrag W. Bradley, Monroe, both of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 24, 1980, Ser. No. 114,937
Int. Cl.³ G01D *15/10, 15/34;* **B41J** *3/20, 11/08*
U.S. Cl. 346—76 PH **6 Claims**

1. In a moving head recording apparatus of the type wherein a recording medium is advanced between a moving head and a platen having a pliable and resilient layer that deforms at the location of contact of the moving head upon the recording medium, the improvement comprising a deformable sheet of low friction material interposed between the platen and the recording medium, the deformable sheet deforming at the

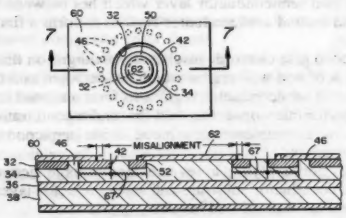


location of contact of the moving head and the recording medium to conform with the deformation thereat in the platen.

4,327,367
THYRISTOR WITH EVEN TURN-ON LINE POTENTIAL AND METHOD WITH 1-MICRON TO 5-MIL WIDE ALIGNMENT REGION BAND

Victor A. K. Temple, Clifton Park, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 899,309, Apr. 24, 1978, abandoned. This application Jul. 25, 1980, Ser. No. 172,449
Int. Cl.³ H01L *29/74*
U.S. Cl. 357—38 **7 Claims**



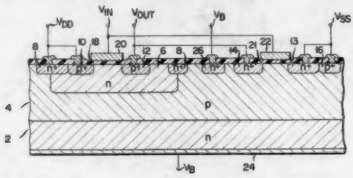
1. A thyristor comprising: a semiconductor body having a top surface and having at least four zones of alternate conductivity type; including an emitter zone of a first conductivity type extending to said top surface having an emitter electrode on said surface in contact with said emitter zone, and a base zone adjacent said emitter zone and also extending to said top surface and having a control electrode on said surface in contact with said base zone, a turn-on junction at the interface of said emitter and base zone, means for correcting for a predetermined expected misalignment, Δ, between said emitter and control electrodes and said emitter and base zones respectively, including an alignment band of said first conductivity type in said base zone spaced apart from said emitter zone and extending to said top surface, the interface of said base zone and said alignment band defining an alignment edge on said top surface spaced an equal minimum distance from said turn-on junction at all points, said alignment band being between said alignment edge and said emitter zone, and having a horizontal width between said alignment edge at one extremity and an outside edge facing said turn-on junction at the other extremity, such width being between 1 micron and 5 mils which corresponds to 1 to 3Δ, said control electrode being in contact with said alignment band and overlying said alignment edge, said alignment edge defining the line closest to said emitter zone at which said control electrode contacts said base zone.

4,327,368

CMOS TRANSISTOR PAIR WITH REVERSE BIASED SUBSTRATE TO PREVENT LATCH-UP

Yukimasa Uchida, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 19, 1979, Ser. No. 76,845
Claims priority, application Japan, Sep. 28, 1978, 53-118587
Int. Cl.[3] H01L 27/02
U.S. Cl. 357—42 7 Claims



1. A semiconductor device comprising:
a semiconductor substrate of a first conductivity type;
a semiconductor layer having a second conductivity type opposite to said first conductivity type and formed on said semiconductor substrate;
a well region of the first conductivity type formed in the surface area of said semiconductor layer to a depth which avoids contact with said semiconductor substrate;
first and second semiconductor regions of the first conductivity type formed in the surface area of said semiconductor layer;
third and fourth semiconductor regions of a second conductivity type formed in the surface area of said well region;
a first gate electrode insulatively formed on that surface area of said semiconductor layer which lies between said first and second semiconductor regions to form a first transistor;
a second gate electrode insulatively arranged on that surface area of said well region which lies between said third and fourth semiconductor regions to form a second transistor;
means for interconnecting said first and second transistors to form a complementary metal oxide semiconductor inverter; and
means for applying a reverse bias voltage between said semiconductor substrate and semiconductor layer to prevent latch-up of said inverter.

4,327,369

ENCAPSULATING MOISTURE-PROOF COATING

Neil Kaplan, Great Neck, N.Y., assignor to Hi-Tech Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 64,005, Aug. 6, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 180,904
Int. Cl.[3] H01L 23/30
U.S. Cl. 357—72 11 Claims

1. An encapsulated electric or electronic device, the device having a surface selected from the group consisting of metals and semi-metals, the capsule being formed from a thermosetting liquid resin composition designed and adapted for use in an injection molding process, the composition comprising an unsaturated thermosettable resin capable of cross-linking to form a thermoset polymer and a cross-linking monomer capable of copolymerizing with the thermosettable liquid to form a cross-linked thermoset polymer, and a trialkoxy organometalsilane compound in an amount sufficient to significantly improve the moisture resistance of the capsule to protect the device, the trialkoxy organometalsilane compound having the empirical formula:

$$(C_xH_{2x+1}O)_3SiZ—M$$

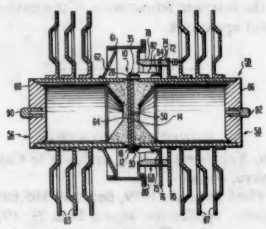
wherein X is an integer from 1 to about 6, Z is an organic group containing up to about 28 carbon atoms and reactive with the encapsulating resin, Z being linked to the silicon atom by a carbon atom, and M is a metal, the capsule being formed in a mold having a metallic surface directly in contact with the molded material.

4,327,370

RESILIENT CONTACT RING FOR PROVIDING A LOW IMPEDANCE CONNECTION TO THE BASE REGION OF A SEMICONDUCTOR DEVICE

Sebastian W. Kessler, Jr., Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 28, 1979, Ser. No. 53,510
Int. Cl.[3] H01L 23/42, 23/44, 23/46
U.S. Cl. 357—79 13 Claims



1. In a semiconductor device comprising a body of semiconductor material having first and second major surfaces, said first surface including an emitter-base structure having a plurality of discrete emitter regions interdigitated with a base region, said base region having a base contact ring thereon, and base terminal means electrically connected to said base contact ring, the improvement wherein said base terminal means comprise:
a conductive base feed-through ring including a base terminal, said base feed-through ring being concentric with and spaced from said base contact ring and having projecting means extending from and around the entire inner circumference of said base feed-through ring, said projecting means being directed towards said base contact ring, and
a resilient contact ring disposed between said base contract ring and said projecting means of said base feed-through ring thereby providing a low impedance electrical interconnection therebetween.

4,327,371

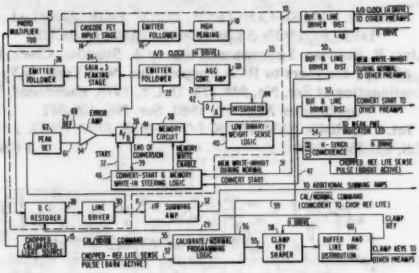
METHOD AND APPARATUS CALIBRATING A PLURALITY OF PREAMPLIFIERS

Alvin W. Edson, Binghamton, and Richard A. Windyka, Chenango Bridge, both of N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Dec. 19, 1979, Ser. No. 105,067
Int. Cl.[3] H04N 9/62
U.S. Cl. 358—10 30 Claims

1. A calibration circuit for a preamplifier connected to amplify the output from a photomultiplier tube or the like, which comprises:
automatic gain control circuit means for receiving said output of said tube;
a calibrated source of light for directing a predetermined level of light onto said tube during a calibration mode thereof;
means for comparing the output of said preamplifier during said calibration move with a predetermined voltage level and for generating an error voltage proportional to the difference therebetween, wherein said predetermined

voltage level represents the response of a properly calibrated tube to said predetermined level of light; and



means for periodically storing said error voltage and for feeding same to said automatic gain control circuit means for adjusting the gain thereof.

4,327,372
ENCODING CIRCUIT FOR A SECAM COLOR TELEVISION TRANSMITTER

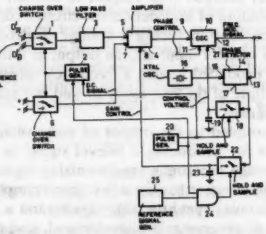
Nicolaas J. L. Van der Valk, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 9, 1980, Ser. No. 157,751

Claims priority, application Netherlands, Jun. 27, 1979, 7904985

Int. Cl.³ H04N 9/40

U.S. Cl. 358—14 **13 Claims**



1. An encoding circuit for a SECAM colour television transmitter comprising:

a pulse generator for generating a line signal frequency and a field signal frequency, a frequency modulator circuit switchably connected to said pulse generator and comprising a frequency-modulatable oscillator for converting a modulating signal containing two color difference signals which follow one another line-sequentially each color difference signal having a direct current component added thereto, into a frequency-modulated signal having a first reference frequency at a first value of the first colour difference signal and a second reference frequency at a second value of the second colour difference signal,

a first phase control loop connected to said frequency modulator circuit for generating a first control voltage for said frequency modulator circuit and including a first sample and hold circuit, said first sample and hold circuit being operative in a time interval in which said first color difference signal has said first value,

a first reference signal generator connected to said first phase control loop for generating a signal having the first reference frequency, and

further comprising a second phase control loop connected to said frequency modulator circuit for generating a second control voltage for said frequency modulator circuit and including a second sample and hold circuit, said second sample and hold circuit being operative at field frequency and in a time interval in which said second color difference signal has said second value,

a second reference signal generator being connected to said second phase control loop, so that the frequency of the signal generated by said second reference signal generator is a harmonic of the line frequency and so that the second sample and hold circuit is operative during a period of time which is long relative to one period of the signal generated by said second reference signal generator.

4,327,373
COMPOSITE COLOR SIGNAL PROCESSING CIRCUIT

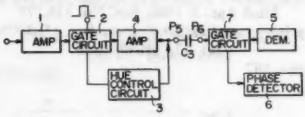
Hiroshi Gomi, Fukaya, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 842,323, Oct. 14, 1977, Pat. No. 4,227,205. This application Aug. 7, 1979, Ser. No. 64,528

Claims priority, application Japan, Oct. 16, 1976, 51-123431

Int. Cl.³ H04N 9/535

U.S. Cl. 358—28 **7 Claims**



1. A composite color signal-processing circuit for processing a time-shared composite color signal including burst and chrominance signals, comprising:

an integrated circuit including

a gate circuit for separating and extracting said burst signal and said chrominance signal from said time-shared composite color signal;

a gain control circuit coupled to said gate circuit for controlling the gain of said chrominance signal; and

a common inactive load for combining said burst signal, without regenerating, with said gain controlled chrominance signal to form a second time-shared signal the combining of chrominance and phase-controlled burst signals in a common inactive load reducing any DC level difference therebetween; and

an AC coupling capacitor for delivering said second time-shared signal from said common load, said coupling capacitor removing any DC component of said combined chrominance and phase-controlled burst signals.

4,327,374
FLESH CORRECTION CIRCUIT FOR A COLOR TELEVISION RECEIVER

Yoshiteru Matsuda, Kadoma; Tetsuo Tomimoto, Osaka, and Yoshitomo Nagaoka, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 2, 1980, Ser. No. 146,118

Claims priority, application Japan, May 10, 1979, 54-57283

Int. Cl.³ H04N 9/535

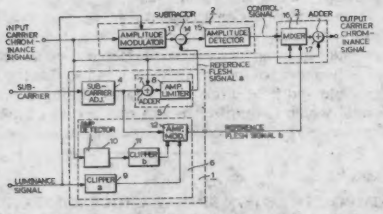
U.S. Cl. 358—28 **15 Claims**

1. A flesh correction circuitry for a color television receiver, for obtaining a desired flesh reproduction and for minimizing color distortions included in a transmitted color signal, comprising:

a reference flesh signal generator for generating two kinds of reference flesh signals;

a flesh signal detector for receiving one of said reference flesh signals and an input carrier chrominance signal, and for generating a control signal corresponding to a phase difference and an amplitude difference between said reference flesh signal and said input carrier chrominance signal; and

a carrier chrominance signal corrector for receiving one of said reference flesh signals, said input carrier chrominance



signal, and said control signal, and for mixing the former two signals in response to the latter control signal.

4,327,375

PROCESS AND APPARATUS FOR PROVIDING DATA INDICATIVE OF THE SHAPE OF LEAF-LIKE ARTICLE

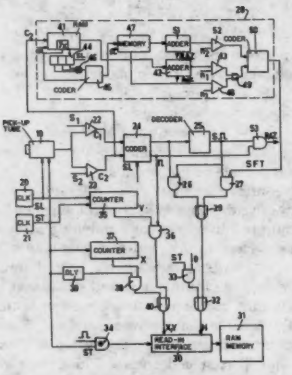
Jean F. Leclerc, Orleans, France, assignor to Service d'Exploitation Industrielle des Tabacs et des Allumettes, Paris, France

Filed Apr. 3, 1980, Ser. No. 136,775

Claims priority, application France, Apr. 11, 1979, 79 09126

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—107 **7 Claims**



1. A process for deriving digital information indicative of the outer contour of a leaf-like article and of the holes which it may comprise, said holes having to be taken into consideration for the use of the article when their dimensions exceed a determined threshold, from a sampled analog video signal composed of image lines and representing the image of the article placed on a support, said process comprising the steps of comparing the video signal, for each image dot or sample, with a threshold and coding the dot "1" or "0" according to the result of the comparison; detecting the transitions in the digital signal thus obtained; coding this digital signal as a "leaf" signal or word when the signal is in state "0" (or "1") and as a "support" word when the signal is in state "1" (or "0") and when it relates to a hole; comparing with the above-mentioned threshold, expressed by a number n_1 of image dots, the number n of dots coded "1" (or "0") which follow one another, firstly in a line X (direction Y), then in consecutive lines X, X+1, etc. (direction X); converting the "support" signals if $n \div n_1$, into "flaw" signals and transmitting them unchanged if $n < n_1$; storing solely the signals preceding a transition, together with corresponding position data Y, by writing them line by line as said lines appear; reading the stored information in an order opposite the order of writing, whereby line X+1 is read before line X; transmitting the signals other than the "support" signals unaltered, and processing the "support" signals as follows: if a "support" signal of a line X is located in the vicinity of a "flaw" signal present in previously read line X+1, it is converted into a "flaw" signal, and if this is not the case, it is not transmitted.

4,327,376

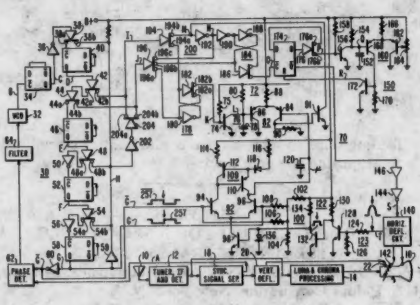
DUAL PHASE-CONTROL LOOP HORIZONTAL DEFLECTION SYNCHRONIZING CIRCUIT

Alvin R. Balaban, Lebanon, and Steven A. Steckler, Clark, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 948,775, Oct. 5, 1978, abandoned. This application Mar. 13, 1980, Ser. No. 129,841

Int. Cl.³ H04N *5/04;* H03K *5/20;* H03B *3/04;* H03K *1/17*

U.S. Cl. 358—159 **8 Claims**



1. A horizontal synchronizing arrangement for a television display apparatus including a source of horizontal synchronizing signals and also including a horizontal deflection circuit responsive to drive pulses to produce deflection current defining recurrent trace and retrace intervals and producing retrace pulses variably delayed with respect to said drive pulses as a function of loading of said deflection circuit, comprising:

a phase-lock loop including a voltage controlled oscillator having a control input and an output at which an output signal is produced having a frequency substantially equal to a multiple of the frequency of said horizontal synchronizing signals;

a divider coupled to the output of said voltage controlled oscillator for producing a bilevel signal in synchronism with average horizontal synchronizing signals;

a first phase detector having a first input coupled to receive said horizontal synchronizing signals and a second input coupled to receive said bilevel signal, and an output for producing a first phase comparison signal; and

a first loop filter coupled between said output of said first phase detector and said control input of said voltage controlled oscillator; and

a phase control loop for maintaining said retrace pulses in synchronism with said bilevel signal, said phase control loop comprising:

a ramp generator responsive to said bilevel signal for producing a ramp signal exhibiting a period which is substantially equal to the period of said average horizontal synchronizing signals;

a second phase detector having a first input responsive to said bilevel signal and a second input responsive to said retrace pulses for producing at an output a second phase comparison signal;

a second loop filter coupled to said output of said second phase detector;

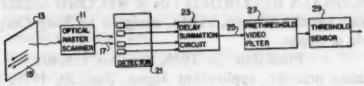
a delay circuit having a first input responsive to said ramp signal and a second input coupled to said second loop filter for initiating an output signal at a time delayed by up to approximately one period of said average horizontal synchronizing signals during the occurrence of one period of said ramp signal; and

a horizontal drive circuit responsive to said delayed output signal for producing horizontal drive signals.

4,327,377
PHASE-SLIPPED TIME DELAY AND INTEGRATION SCANNING SYSTEM

Edward H. Takken, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 6, 1980, Ser. No. 157,126
Int. Cl.³ H04N 5/33
U.S. Cl. 358—199 **10 Claims**



1. A scanning system comprising:

a linear array of N detector elements having a uniform spacing of X cm. between their centers;

means for scanning a field of view in two dimensions at a rate of V cm. per second along one of the two dimensions and applying received energy to the array,

the array being oriented parallel to the one of the scanning dimensions, each detector element adapted to produce, when sampled, an output signal proportional to integrated energy exposure thereof between samplings;

means for sampling the N detector elements every t_s seconds, where

$$t_s = \frac{1}{\left(k + \frac{1}{N}\right)}\left(\frac{X}{V}\right)$$

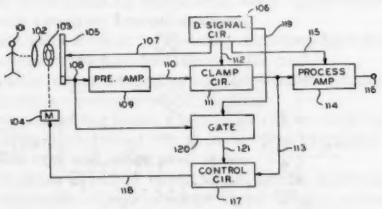
and k is an integer; and

delay summation means for delaying the output signals from each of the N detector elements as a function of the scan rate and relative position of each of the detector elements and summing the delayed output signals from each of the detector elements so as to provide a resultant output signal indicative of relative energy distribution within the field of view.

4,327,378
AUTOMATIC IRIS CONTROL FOR SOLID-STAGE IMAGING APPARATUS

Takanori Tanaka, and Masanobu Morishita, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1980, Ser. No. 156,163
Claims priority, application Japan, Jun. 8, 1979, 54-72021
Int. Cl.³ H04N 5/26
U.S. Cl. 358—228 **13 Claims**

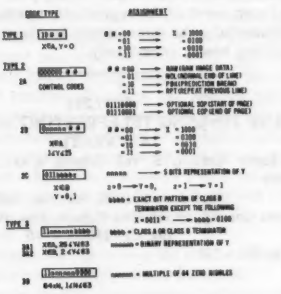


1. A solid-state imaging apparatus comprising: charge-coupled imaging means including an imaging area for generating charges responsive to light incident thereon, output means responsive to the charges generated in the imaging areas for producing an electrical output signal; first means for obtaining a video information signal from said electrical output signal; second means for obtaining a reference signal from said electrical output signal; optical iris means for controlling the intensity of light incident upon at least a part of said imaging area; first iris control means responsive to said video information signal for controlling said optical iris means and to said reference signal; overflow detection means for detecting an overflow of charges from said imaging area; and second iris control means responsive to the output of said overflow detection means for controlling said optical iris to lower said intensity of the light; whereby, when there is not an overflow of charges from said imaging area, said optical iris is controlled by said first iris control means to maintain said intensity of the light to a proper value, and, when there is an overflow of charges from said imaging area, said optical iris is controlled by said second iris control means to lower the intensity of light and thereby prevent said overflow of charges.

4,327,379
HARDWARE IMPLEMENTATION OF 4-PIXEL CODE ENCODER

Vinod K. Kadakia, Torrance; Glen D. Jones, Orange; Kedar D. Parikh, Seal Beach, and Ronald E. Rider, Palos Verdes Estates, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 11, 1980, Ser. No. 139,501
Int. Cl.³ H04N 1/40
U.S. Cl. 358—261 **10 Claims**



1. An encoding circuit which receives data to be encoded in four bit nibbles and which produces code words encoding the run length of all-zero nibbles and the terminating pattern, said words being from four to twelve bits in length, in multiples of four bits, comprising

a counter for counting the number of four bit all-zero nibbles preceeding a terminating nibble

an encoder responsive to said count and to the reception of a terminating nibble, for producing a four, eight or twelve bit code word containing a coded run length portion, a coded terminating portion, and a plurality of code bits specifying the length of the code word, and

a packing circuit for packing said code words into a fixed length series of output words.

4,327,380
CONTROL METHOD FOR REPRODUCTION PICTURE POSITIONS IN A DIRECTION OF A CYLINDER'S AXIS

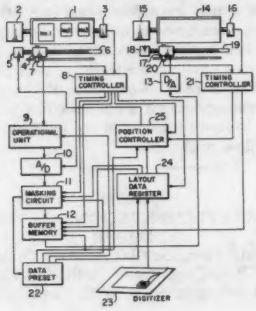
Mitsuhiko Yamada, and Toshiaki Nakade, both of Kyoto, Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Japan

Filed Aug. 20, 1980, Ser. No. 179,697
Claims priority, application Japan, Aug. 24, 1979, 54-107884
Int. Cl.³ H04N 1/36
U.S. Cl. 358—264 **3 Claims**

1. A method for controlling the position at which pictures are reproduced on a recording film mounted on a recording

cylinder in the direction of the cylinder's axis, for use in a picture reproducing machine, comprising the steps of:

(a) detecting the distances of a pickup and a recording head from a scanning start point of each original picture and a recording start point of each reproduction picture, respectively, on the basis of a standard position through which the recording head is moved at a fixed speed; and



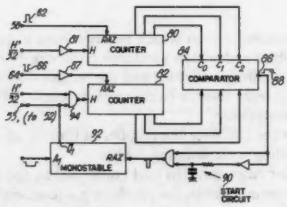
(b) controlling the moving speed of the pickup head according to the distances detected and reproduction scales which vary as a function of said distances so that the scanning start point of the original picture and the recording start point of the reproduction picture are scanned at substantially the same instant by the pickup and the recording heads, respectively.

4,327,381

BLANK JUMPING TELEPRINTING METHOD AND APPARATUS

Jean-Claude Amicel, 5, rue Jeanne d'Arc, 22300 Lannion, France

Filed Jun. 3, 1980, Ser. No. 156,108
Claims priority, application France, Jun. 19, 1979, 79 15681
Int. Cl.³ H04N *1/40*
U.S. Cl. 358—288 **5 Claims**



1. A blank jumping teleprinter comprising:

a means for reading a document line by line, each line having N points and being read point by point, said means delivering for each point a reading signal;

a means for controlling said reading means so that each line is read the same number of times as the reading means supplies groups of P reading signals incorporating at least one non-zero signal, P being a submultiple of N;

an electronic curtain placed after said means for reading, said electronic curtain permitting the passage of each group containing at least one non-zero signal at each reading of the line;

a memory connected to the electronic curtain, said memory having P cells successively receiving the P reading signals belonging to a group of P reading signals containing at least one non-zero signal;

a demultiplexer connected to said memory; and

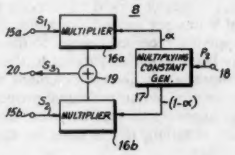
a writing means connected to said demultiplexer, said writing means having N writing points organized in groups of P points, said demultiplexer making it possible to address the contents of the P cells of the memory to the group of the writing means corresponding to the group of read points.

4,327,382

METHOD AND APPARATUS FOR EDITING DIGITAL SIGNALS RECORDED ON A RECORD MEDIUM

Masato Tanaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 29, 1980, Ser. No. 116,401
Claims priority, application Japan, Jan. 30, 1979, 54-9498; Jan. 30, 1979, 54-9500; Jan. 31, 1979, 54-10650
Int. Cl.³ G11B *27/02, 5/00*
U.S. Cl. 360—13 **47 Claims**



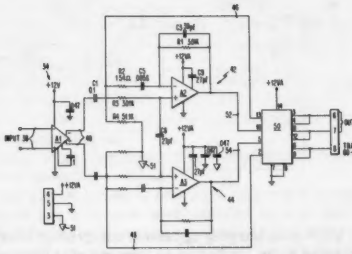
1. Apparatus for editing digital signals recorded on a record medium, comprising reproducing means for reproducing said digital signals from said record medium; recording means for recording digital signals on said record medium, said recording means being relatively spaced from said reproducing means; delay means for delaying the digital signals reproduced from said record medium by a time delay determined by the relative spacing between said recording and reproducing means; a source of edit digital signals; mixing means for mixing the delayed reproduced digital signals and the edit digital signals by gradually decreasing the value of one while concurrently gradually increasing the value of the other and combining the decreasing and increasing signals such that one of said digital signals gradually is replaced by the other; and means for supplying the mixed digital signals to said recording means.

4,327,383

READ CIRCUIT FOR A FLOPPY DISK DRIVE

Dewilton R. Holt, El Toro, Calif., assignor to Siemens Corporation, Iselin, N.J.

Filed Sep. 26, 1980, Ser. No. 190,972
Int. Cl.³ G11B *5/09*
U.S. Cl. 360—45 **34 Claims**



1. In apparatus for reading digital data recorded on a record medium, said apparatus comprising a read transducer for generating an electrical signal corresponding to the recorded data,

amplifier means for amplifying said electrical signal, and equalizing filter means for modifying said electrical signal, the improvement wherein said equalizing filter means has a response, in the frequency domain, determined by the Laplace transform:

$$F(s) = \frac{1 - T_1 T_2 s^2}{T_2 s + 1}, \text{ where}$$

s is the complex frequency $\sigma + j\omega$,

T_1 is a time constant which creates a high frequency pole on the complex s plane, and

T_2 is a time constant which creates a low frequency zero on the complex s plane.

4,327,384

ROTARY HEAD TYPE MAGNETIC TAPE RECORDING REPRODUCING APPARATUS

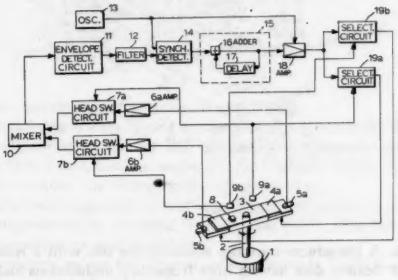
Masao Tomita, Neyagawa; Takenobu Isaka, Moriguchi; Mineo Mino, Hirakata, and Kiyoji Fujisawa, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 29, 1980, Ser. No. 116,464

Claims priority, application Japan, Jan. 31, 1979, 54-10127

Int. Cl.³ G11B *21/10, 5/54*

U.S. Cl. 360—77 **3 Claims**



1. A rotary head type magnetic tape recording/reproducing apparatus comprising:

rotary head means for reproducing video signals recorded along a track on a record medium;

a positionable element for mounting said rotary head means thereon for displacement lateral to the track;

oscillation means coupled to said positionable element to provide a continuous lateral vibration;

envelope detecting means which detects an envelope signal bearing a correspondence to an envelope of a signal derived from said rotary head means;

synchronous detection means which detects synchronous components of said envelope signal using a reference signal from said oscillation means;

integration adder means including an adder and a delay means; and

drive control means for supplying to said positionable element a compound signal which includes a signal from said integration adder means and said signal from said oscillation means.

4,327,385

CASSETTE LOADING AND UNLOADING DEVICE FOR VIDEO TAPE RECORDER

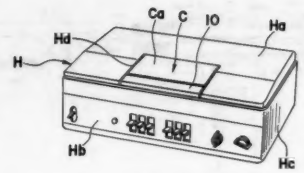
Kazuo Fujii, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 5, 1980, Ser. No. 156,653

Claims priority, application Japan, Jun. 11, 1979, 54/73663; Jun. 11, 1979, 54/79735[U]

Int. Cl.³ G11B *15/66, 19/18, 23/04*

U.S. Cl. 360—96.5 **5 Claims**



1. A cassette loading and unloading mechanism for a video tape recorder comprising a recorder housing constituted by top and bottom walls and a surrounding side wall, all of these walls being assembled together to provide a substantially container-like configuration, and a cassette holder having a generally rectangular entrance through which a video tape cassette is selectively inserted into and removed from the cassette holder, said cassette holder being supported for movement between the eject position, in which the cassette holder is positioned outside the housing and upwardly of the top wall in readiness for the insertion and removal of the tape cassette into and from the cassette holder, respectively, and the set position in which the cassette holder is positioned inside the housing with the top of said cassette holder held in flush with the top wall, said cassette loading and unloading mechanism comprising, in combination:

a first support means for supporting the cassette holder for movement between the eject and set positions;

a first biasing means for urging the cassette holder to assume the eject position;

an eject bar positioned frontwardly of the cassette holder in the set position and having its longitudinal extent extending in parallel to the top wall;

a second support means for supporting the eject bar for movement between upwardly biased and depressed positions, said eject bar when in the upwardly biased position concealing the entrance of the cassette holder, said eject bar when moved to the depressed position permitting the cassette holder to move from the set position towards the eject position;

a second biasing means for urging the eject bar to assume the upwardly biased position;

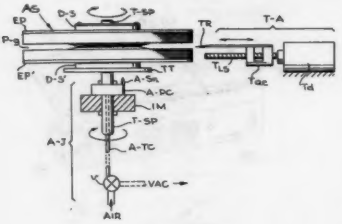
a first releasable locking means for locking the cassette holder in the set position when and after the cassette holder has been moved thereto and also for releasing the cassette holder from the set position to enable the cassette holder to move towards the eject position by the action of the first biasing means in response to the arrival of the eject bar at the depressed position; and

a second releasable locking means for locking the eject bar in the depressed position when and after the eject bar has been moved thereto and also for releasing the eject bar from the depressed position to enable the eject bar to move towards the upwardly biased position by the action of the second biasing means in response to the arrival of the cassette holder at the set position.

4,327,386
PNEUMATIC COMMUTATOR FOR END-WISE PARTITIONING

Dean DeMoss, Camarillo; Norman S. Blessum, Thousand Oaks; Ko Ko Gyi, Thousand Oaks, and Herbert U. Ragle, Thousand Oaks, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 31, 1979, Ser. No. 71,577
Int. Cl.[3] G11B 5/016, 23/02, 25/04
U.S. Cl. 360—99 8 Claims



1. An improved pneumatic directing arrangement adapted to direct at least one gas stream through a flexible disk pack, end-wise and axially, this pack being characterized by an array of bores extending axially through the pack cross-section, the bores terminating at a respective interdisk gap for conducting the gas stream thereto; this arrangement comprising, in combination therewith;

bore-Select means disposed externally of said pack and adapted to receive at least one gas stream and to controllably project the stream toward a prescribed intake locus, disposed remote from said pack at virtually any distance and direction therefrom; and

pneumatic Distributor means arranged in operative relation about this Select means, serving to extend said bores to said locus and adapted to couple a gas stream from said Select means to any selected one of the bores and associated inter-disk gaps;

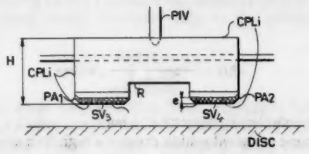
said Distributor means comprising a hollow cylinder, and said Select means comprising a dual channel rotor disposed co-axially with said Distributor means and adapted to direct a pair of gas streams to respective bore-extending ducts in the Distributor means, selectably according to the rotational position of the rotor relative to the Distributor means.

4,327,387
MAGNETIC HEAD SLIDER ASSEMBLY COMPRISING AT LEAST ONE TRANSDUCER FOR READING AND/OR RECORDING INFORMATION CONTAINED ON A DATA CARRIER

Michel Plotto, Plaisir, France, assignor to Compagnie Internationale pour l'Informatique CII/Honeywell Bull, Paris, France

Filed Jan. 10, 1980, Ser. No. 110,921
Claims priority, application France, Jan. 17, 1979, 79 01142
Int. Cl.[3] G11B 5/22, 5/60, 17/32
U.S. Cl. 360—103 4 Claims

1. A magnetic head slider assembly comprising a body supporting at least one transducer for reading and/or recording of the data contained in a data carrier, one surface of said body adapted to face the data carrier, at least one part of said surface being constituted by a lubricating monomolecular layer having

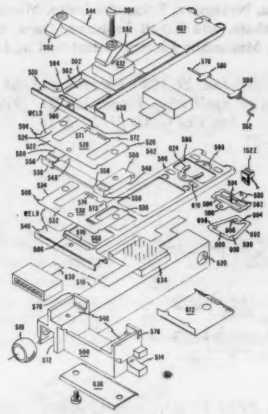


polar termination and a thickness in the range of 30 to 50 angstroms.

4,327,388
TRANSDUCER-CARRIAGE ASSEMBLY WITH SPRING SUSPENSION

Donald J. Wanek, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 15, 1980, Ser. No. 121,947
Int. Cl.[3] G11B 5/48, 5/54, 21/12, 21/20
U.S. Cl. 360—104 10 Claims



1. A transducer-carriage assembly for use with a rotatable thin flexible disk having high frequency undulations and low frequency undulations as the disk rotates and comprising:

a pair of transducers,

a pair of arms adapted to embrace the disk,

a support,

a pair of leaf springs mounted on said support and respectively connected to said arms adjacent one end thereof and which lie in single planes in the unstressed condition so that the other, distal ends of said arms may swing without impediment by said support, and

a pair of gimbal springs having said pair of transducers respectively secured thereto and respectively attached to said pair of arms adjacent the distal ends thereof to position said pair of transducers at opposite sides of said disk,

said gimbal springs, when unstressed, being substantially coplanar to said leaf spring connected to the respective arm, and

a resilient load member carried by each of said arms adjacent to and engaging said gimbal spring to permit universal motion of the associated transducer about the point of contact between said gimbal spring and said load member, whereby said arm and transducer assemblies may swing simultaneously and as a unit both in the same direction or

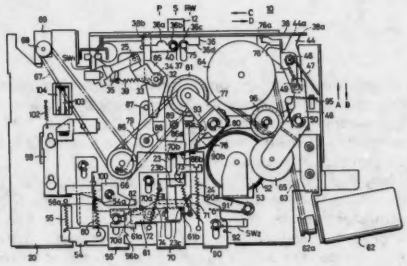
both in the opposite direction in a plane parallel with the axis of the disk with flexing of said leaf springs for low frequency undulations of the disk and said gimbal springs may flex without substantial swinging movements of said arms with high frequency undulations of the disk with said transducers being in data transferring contact with the disk for both the low frequency undulations and also the high frequency undulations.

4,327,389

CASSETTE TYPE TAPE RECORDER

Kazuo Kohda, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 9, 1979, Ser. No. 19,125
Claims priority, application Japan, Mar. 10, 1978, 53/27458; Mar. 10, 1978, 53/30734[U]
Int. Cl.³ G11B 21/22, 5/54
U.S. Cl. 360—105 8 Claims



1. A cassette type tape recorder comprising:

tape driving system having a capstan and a pinch roller for cooperatively driving and advancing a magnetic tape within a tape cassette, and a take-up reel disc driven by a drive roller for taking up the advanced tape;

a head base supported on said tape recorder structure having magnetic heads mounted thereon, said pinch roller being supported on said head base;

an ejection means for removal of a previously loaded tape cassette out of said tape recorder structure when manually operated, said ejection means urging said head base to move backward to a position separated from the cassette loaded position when manually operated;

means for moving said head base forward toward said cassette in the loaded position, responsive to loading of said cassette, said magnetic head thereby coming into contact with the magnetic tape within said cassette;

retaining means for holding the pinch roller and the drive roller at positions respectively separated from the capstan and the take-up reel disc, even when said head base is moved forward;

means for storing a force for urging said pinch roller and said drive roller forward when the pinch roller and the drive roller are being held by retaining means during movement of the head base; and

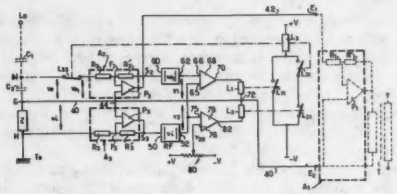
releasing means operable after said cassette has been loaded, for releasing the holding of said retaining means, said pinch roller and said drive roller being urged against said capstan and said take-up reel disc respectively by the force stored by said storing means.

4,327,390

CAPACITIVE VOLTAGE TRANSFORMERS WITH ELECTRONIC OUTPUT

Philippe Despiney, le Perreux, France, assignor to Enertec, Montrouge, France

Filed Apr. 28, 1980, Ser. No. 144,466
Claims priority, application France, May 9, 1979, 79 11690
Int. Cl.³ H02H 7/16
U.S. Cl. 361—16 11 Claims



1. A voltage detection means for a capacitive voltage divider which comprises a first and a second capacitor in series intended to be connected between a high voltage line and a means at reference potential, for the purposes of supplying an inductive load, comprising:

means for making a high-impedance connection between two points of the capacitive divider, on respective sides of said second capacitor, and said inductive load, to supply to said load a signal which depends on the voltage at the terminals of the second capacitor;

means for producing a current signal depending on the current passing through the capacitive divider;

means for forming a control signal depending on said current signal and a voltage at the terminals of a capacitive portion of said divider; and

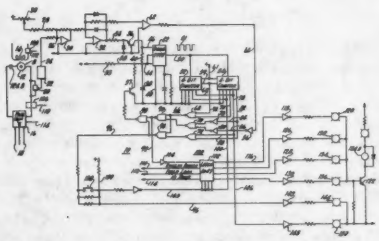
means for modifying said high-impedance connection in response to said control signal when a predetermined relationship is established between said current and said voltage.

4,327,391

MOTOR PROTECTION CIRCUIT

Chester J. Grzebielski, Grafton, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Jan. 31, 1980, Ser. No. 117,059
Int. Cl.³ H02H 7/085
U.S. Cl. 361—31 10 Claims



1. A protection circuit for protecting a motor against inversely related, adverse conditions of excess current and exposure time, said motor having means associated therewith for providing a signal indicative of motor current, said protection circuit comprising:

means generating a reference signal corresponding to a predetermined level of motor current;

means connected to said reference signal means and said

motor current signal means for producing a difference signal indicative of current in excess of the predetermined level;

means responsive to said difference signal for generating a pulse train signal having a pulse rate corresponding to the difference signal;

counting means coupled to said pulse train signal generating means for counting the pulses of said signal and for providing an output signal indicative of the adverse conditions when a first predetermined number of pulses have been counted;

means connected to said difference signal producing means and to said counting means for causing said counter to count up when said motor current signal exceeds said reference signal and to count down when said reference signal exceeds said motor current signal;

means coupled to said pulse train signal generating means for changing the pulse rate of the pulse train signal when said counter is counting down;

output means coupled to said counting means and operable by said output signal for deenergizing the motor when adverse conditions are approached; and

means for altering said output signal when said counter has counted down to a second predetermined number for permitting the motor to be reenergized.

4,327,392

PROTECTIVE APPARATUS FOR USE WITH POWER LINES

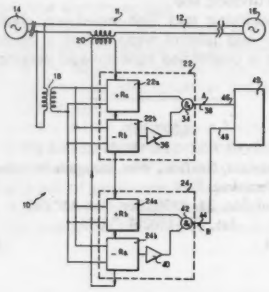
Michel Souillard, Fontenay aux Roses, France, assignor to Enertec, Montrouge, France

Filed Oct. 15, 1980, Ser. No. 197,050

Claims priority, application France, Oct. 17, 1979, 79 25784

Int. Cl.³ H02H *3/48, 3/42*

U.S. Cl. 361—80 **5 Claims**



1. Protective apparatus to be mounted at one end of an A.C. electrical power line coupled between normally-synchronised generators for producing at least a first output signal, the state of which differs according as a loss of synchronism between the generators or power oscillations occurs, this apparatus comprising at least first and second impedance sensing means producing respectively first and second indicative signals, said first indicative signal having a first or a second of two different states according as the apparent impedance of the line lies inside or outside a first impedance area, said second indicative signal having a first or a second of two different states according as said apparent impedance lies inside or outside a second impedance area, the first and second areas having an area of overlap in common through which the line impedance passes in the event of a loss of synchronism, this apparatus further comprising an output circuit connected to said impedance sensing means for generating at least said first output signal depending on at least one sequence of three changes of state of said first and second indicative signals, wherein said output circuit is responsive to sequences of at least three changes of states affecting indifferently said first and second indicative signals in order to produce said first output signal in a first or a second state only according as the sensing means sensed or not a sequence of at least three changes of state in which any two consecutive changes of state of the sequence concern two different signals.

4,327,393

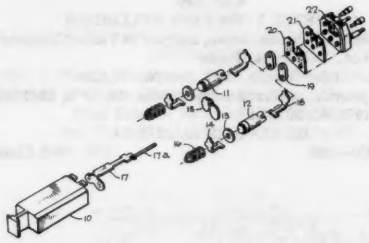
PROTECTOR MODULE BASE ASSEMBLY WITH AN EXTERNAL SPARK GAP

William W. Hines, and Casimir Z. Cwirzen, both of Arlington Heights, Ill., assignors to Northern Telecom, Inc., Nashville, Tenn.

Filed Jan. 7, 1980, Ser. No. 110,115

Int. Cl.³ H02H *9/04*

U.S. Cl. 361—119 **7 Claims**



1. A building entry surge protector module having a modified base assembly to provide an external spark-gap, said modified base assembly comprising:

a conductive ground plate contiguous the insulating inner base surface of said protector module;

an insulator plate coextensive and contiguous with the grounding plate insulating it from plug contacts inside the protector module;

said grounding and insulator plates having openings therein for passage of external plugs of said protector module therethrough to establish contact with said plug contacts, the openings in said grounding plate being sufficiently large to preclude any contact with said plugs; and

said insulator plate having holes therein intermediate said plug contacts and said grounding plate to provide said external spark-gap.

4,327,394

INDUCTIVE LOAD DRIVE CIRCUIT UTILIZING A BI-LEVEL OUTPUT COMPARATOR AND A FLIP-FLOP TO SET THREE DIFFERENT LEVELS OF LOAD CURRENT

Patrick D. Harper, Seaford, Va., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 881,328, Feb. 27, 1978, abandoned. This application Jun. 28, 1979, Ser. No. 53,007

Int. Cl.³ H01H *47/32*

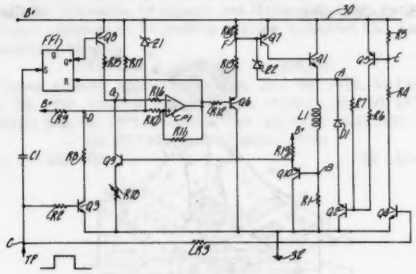
U.S. Cl. 361—154 **4 Claims**

1. In a current control circuit enabled by a load actuation signal and comprising switch means operative to actuate an inductive load by increasing the current thereto above a first current level and to thereafter alternatively connect and disconnect a power supply to the load so as to maintain load actuation with current in a range between a second current level and a third current level, each less than said first current level;

(a) load current sense means comprising a first sense resistor in series with said inductive load and second sense resistor connected in parallel with said first sense resistor;

(b) reference means providing at least two reference voltages representing two of said first, second, and third current levels;

(c) comparator means having a sense input coupled to said second sense resistor, a reference input coupled to said reference means, and an output coupled to the switch means, said comparator means adapted to generate a first comparator output level when a sense voltage at said sense input is a greater magnitude than a reference voltage at said reference input and a second comparator output level when said sense voltage is less than the magnitude of the reference voltage at said reference input;



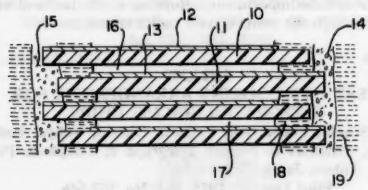
(d) flip-flop means coupled to said comparator means and to circuit means responsive to the attainment of said first current level, said flip-flop means comprising variable current source means coupled in series with said second sense resistor and operative to change the current therethrough in response to said attainment of said first current level.

4,327,395

METALLIZED POLYPROPYLENE FILM CAPACITOR

Takayuki Yagitani, Nishinomiya, and Osamu Ebisu, Osaka, both of Japan, assignors to Shizuki Electric Co., Inc., Nishinomiya, Japan

Filed Sep. 15, 1980, Ser. No. 187,078
Int. Cl.[3] H01G *4/02*
U.S. Cl. 361—326 **10 Claims**



1. A metallized polypropylene film capacitor comprising:

a. a container and

b. mounted within said container at least one wound body comprising concentric layers of metallized polypropylene film, with the layers of polypropylene alternating with layers of the metal employed to metallize said polypropylene,

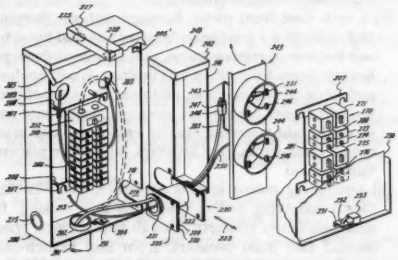
c. said at least one body containing within the space between the alternating layers of polypropylene and metal at least one electronegative gas occupying a majority of said space said electronegative gas not being combined with a liquid and in the remaining space within said container a coolant oil having little or no swelling effect on said polypropylene.

4,327,396

COMBINATION OF ELECTRICAL METER SOCKET COLUMN AND PANELBOARD FOR CONVERSION TO INDIVIDUAL TENANT METERING

Ezra L. Schacht, P.O. Box 8367, Houston, Tex. 77004

Continuation-in-part of Ser. No. 923,545, Jul. 11, 1978, abandoned. This application Nov. 7, 1979, Ser. No. 91,933
Int. Cl.[3] H02B *1/04, 9/00*
U.S. Cl. 361—379 **5 Claims**



1. An improved apparatus converting a conventional panelboard, to a split-bussed panelboard in combination with means for individual-tenant metering, an enclosure of the conventional panelboard containing within it:

(i) a plurality of branch-circuit breakers with operating levers for a plurality of tenants;

(ii) a plurality of branch-circuit conductors connected to said breakers, said conductors entering the enclosure through at least one aperture in a wall thereof;

(iii) an interior mounting pan on which said breakers are mounted;

(iv) a plurality of buses, the buses insulatively mounted upon the interior mounting pan, said breakers electrically connected to the buses;

(v) mounting pan supporting means;

(vi) a feeder conduit containing a plurality of hot feeder conductors;

(vii) a dead-front panel, having apertures for access to the operating levers of said breakers and having means securing the dead-front panel;

(viii) a front cover;

the converting apparatus comprising, in combination:

(a) a replacement interior for the conventional panelboard, said replacement interior having mounting means, having split-busing insulatively supported upon said mounting means, said busing split to isolate electrically said plurality of branch-circuit breakers of each of said tenants, a plurality of branch circuit conductors for each of said tenants being fed through new tenant main breakers, said main breakers being electrically connected to the line side of said split-bus, and said main breakers having means for physical spacing from adjacent said branch-circuit breakers, the enclosure having within it mating mounting means attached to said mounting means of said replacement interior;

(b) a wall of said enclosure having an aperture formed therein;

(c) a first covering and sealing means for said aperture in said enclosure wall, said covering and sealing means having a mating aperture therein;

(d) means coupling said first covering means to a second covering means;

(e) a meter-supporting enclosure, into which said hot feeder conductors are deflected through said coupling means, said second covering means mating with a wall of said meter-supporting enclosure, said meter-supporting enclosure having an aperture in a wall thereof, said meter-supporting enclosure also having covering means, said covering means having means mounting a

plurality of said tenant metering means, said tenant metering means having a plurality of line terminals, said line terminals connected to said feeder conductors within said meter-supporting enclosure, said tenant metering means also having a plurality of load terminals, said load terminals having means for connection through said coupling means to a plurality of line terminals of said main tenant breakers, said meter-enclosure covering means engaged in sealing fashion with said meter-supporting enclosure;

(f) a new dead-front panel, having apertures therein for said individual tenant main-breaker and said branch-circuit breaker operating-levers, said new dead-front panel having means for locking it in position in said enclosure, and when in said position, said dead-front panel enclosing said feeder conductors passing through said enclosure into said meter-supporting enclosure, said branch-circuit conductors, said breakers, and said replacement interior; and

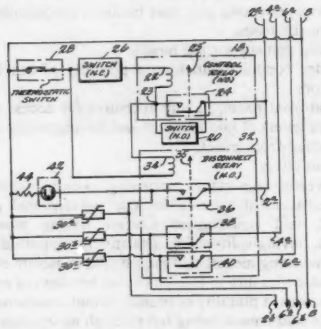
(g) ventilating means in said enclosure, said ventilating means removing excess heat from said bussing, from said maintenant breakers through said physical spacing around said main breakers, from said branch-circuit breakers, from said feeder conductors and said means for connection of said load terminals of said metering means to said tenant main breakers.

4,327,397

COMPUTER POWER/TEMPERATURE PROTECTOR

Winston T. McCleery, 4920 Cottage Hill Rd., Ste. 5, Mobile, Ala. 36609

Filed Jun. 4, 1980, Ser. No. 156,342
Int. Cl.³ H02H *3/20, 3/24, 5/04*
U.S. Cl. 361—90 **11 Claims**



1. A computer power/temperature protector apparatus adapted for insertion into a power cable having at least one power line, said power cable supplying power to an associated computer load, comprising:

means for rendering said at least one power line controllably nonconductive and conductive;

means responsive to an interruption of power being provided thereto for controlling said rendering means to render said at least one power line nonconductive, and responsive to a reset signal for controlling said rendering means to render said at least one power line conductive;

means for manually generating said reset signal;

means for shunting voltage transients appearing on said power line;

temperature sensing means for automatically causing said interruption of power in response to a deviation of sensed temperature from a predetermined temperature range, said reset signal generating means being ineffective for rendering said at least one power line conductive as long as said sensed temperature has deviated from said predetermined range; and

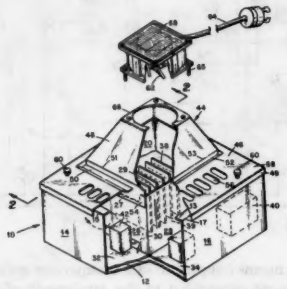
means for causing said interruption of power manually.

4,327,398

COOLING SYSTEM FOR AUTOMATIC BOWLING PIN SPOTTER

Alan M. Christison, Knoxville, Tenn., assignor to Product Technologies, Inc., Knoxville, Tenn.

Filed Sep. 4, 1979, Ser. No. 72,149
Int. Cl.³ H01L *25/00, 23/46;* **F28F** *9/22*
U.S. Cl. 361—384 **5 Claims**



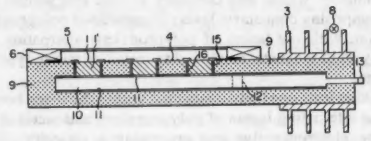
1. A cooling system for an automatic bowling pin spotter control cabinet including generally solid side walls and partition walls defining within said cabinet a first subcompartment having at least one low power electronic component mounted therein and having a generally solid bottom wall and a second subcompartment having at least one high power electronic component mounted therein and having a generally solid bottom wall, said subcompartments being in flow communication with one another adjacent said bottom walls, said cooling system comprising hood means including an inlet section providing cover means for said low power subcompartment and an outlet section providing cover means for said high power subcompartment, said inlet section including fan means and said outlet section including vent means whereby ambient atmospheric air is forced to flow downwardly from said inlet section through said low power subcompartment, laterally into said high power subcompartment, and upwardly through said high power subcompartment, returning to the ambient atmosphere through the vents of said outlet section.

4,327,399

HEAT PIPE COOLING ARRANGEMENT FOR INTEGRATED CIRCUIT CHIPS

Etsuro Sasaki, Fuchu, and Takaaki Ohsaki, Tokyo, both of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan

Filed Dec. 27, 1979, Ser. No. 107,646
Claims priority, application Japan, Jan. 12, 1979, 54-2408
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—385 **13 Claims**



1. An integrated circuit construction comprising a heat pipe structure wiring substrate having a cavity in its interior, a heat pipe wick on the inner surface of said cavity, and a cooling

device attached on the end of said substrate; at least one hole provided in this heat pipe structure wiring substrate to communicate with said cavity; a single crystal substrate with semiconductor integrated circuit devices attached thereto securely fixed within this hole and with a wick similar to said heat pipe wick disposed on the inner surface of the cavity; and a working fluid sealed within said cavity and directly contacting said single crystal substrate via said single crystal substrate wick.

4,327,400

ELECTRIC DOUBLE LAYER CAPACITOR

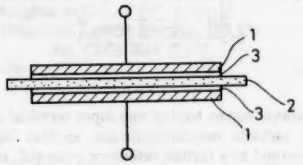
Takayoshi Muranaka, Moriguchi, and Hajime Mori, Uji, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 3, 1980, Ser. No. 109,406

Claims priority, application Japan, Jan. 10, 1979, 54-1607; Jan. 10, 1979, 54-1608; Jan. 10, 1979, 54-1609; Jan. 10, 1979, 54-1610; Feb. 20, 1979, 54-19216; Oct. 12, 1979, 54-132335

Int. Cl.³ H01G *9/00*; B01J *17/00*

U.S. Cl. 361—433 **15 Claims**



1. An electric double layer capacitor comprising:

a pair of polarization electrodes each electrode including a conducting member formed from an expanded metal sheet with a number of expanded holes, and a carbon electrode material including active carbon and a polyvinyl pyrrolidone binder; and

a separator impregnated with an electrolyte and disposed between said polarization electrodes.

4,327,401

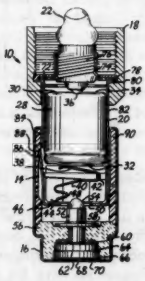
RECHARGEABLE FLASHLIGHT WITH INTEGRAL VARIABLE RATE BATTERY CHARGER FOR AUTOMOTIVE USE

Hemming G. Siiberg, New Providence, N.J., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Division of Ser. No. 932,644, Aug. 10, 1978, Pat. No. 4,224,658. This application Mar. 10, 1980, Ser. No. 128,808

Int. Cl.³ F21L *7/00*

U.S. Cl. 362—183 **6 Claims**



1. In a rechargeable flashlight, a switching device comprising:

(a) a housing;

(b) a sliding member in said housing, said sliding member being electrically conducting;

(c) said sliding member being movable between a first and second position;

(d) means for electrically connecting said sliding member into an electrical lamp circuit;

(e) a rechargeable battery in said housing, said rechargeable battery having two terminals, one of said terminals being electrically connected into said electrical lamp circuit;

(f) an electrically-conducting actuating member fixed in said housing;

(g) said actuation member being electrically insulated from said sliding member;

(h) means for electrically connecting said actuating member to a battery-charging means;

(i) a spring having two ends, said spring positioned between said actuation member and said rechargeable battery so as to be moved from a first position to a second position by said electrically conducting actuating member when said sliding member is moved from said first position to said second position;

(j) one end of said spring is electrically connected to the other terminal of said rechargeable battery;

(k) the other end of said spring is biased into electrical contact with said sliding member when said sliding member is in said first position; and

(l) said spring being lifted from electrical contact with said sliding member by mechanical and electrical contact with said actuating member when said sliding member is in said second position.

4,327,402

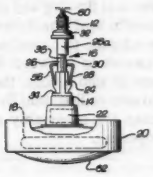
LIGHT FIXTURE

Truman Aubrey, 1472 Beaudry Blvd., Glendale, Calif. 91208

Filed Jul. 12, 1979, Ser. No. 57,260

Int. Cl.³ F21S *1/02*

U.S. Cl. 362—288 **4 Claims**



1. An adjustable-length light fixture suitable for adapting an incandescent light for operation with a light source of another type, said adjustable-length fixture comprising:

a screw-thread connector for electrical connection to a standard incandescent light socket;

an equipment housing to accommodate a light source; and

an adjustable-length member including

a first tube rigidly attached to said equipment housing,

a second tube rigidly attached to said screw-thread connector and telescopically engaged inside said first tube,

corresponding flattened regions on said first and second tubes to prevent relative rotation,

a plurality of saw-tooth-shaped notches formed on said flattened region of said second tube, each notch having a substantially horizontal ledge and an adjoining inclined surface,

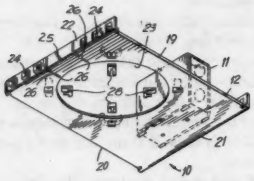
a resilient latch member formed integrally with said first tube and having a free end with a leading edge urged into engagement with a selected one of said notches;

whereby said resilient latch member functions to resist further extension of said adjustable-length member but to allow retraction of said adjustable-length member during installation.

4,327,403
LIGHTING FIXTURE WITH UNIFORM MOUNTING FRAME FOR OLD INSTALLATIONS

Joseph A. Capostagno, Somerset, Mass.; Kingsley Chan, Rutherford, and Alexandre Kartavenko, Bayonne, both of N.J., assignors to Lightolier Incorporated, Jersey City, N.J.

Filed May 8, 1980, Ser. No. 147,853
Int. Cl.³ F21V 3/00
U.S. Cl. 362—306 8 Claims



1. A lighting fixture adapted to be mounted to a tile ceiling structure or the like having an aperture formed therein comprising a support frame including side and end portions defining a generally rectangular configuration having an opening, a transversely directed gap formed in one of said portions and extending to said opening, said frame including a generally planar undersurface portion adapted to rest on the upper surface of said ceiling surrounding said aperture, a plurality of angularly spaced apart guideway portions formed in said frame in proximate spaced relation to and extending in a direction generally parallel with said undersurface, a mounting member supported in each said guideway, said mounting members being generally U-shaped in transverse section and including a first leg slidably supported in said guideway for movement in a plane generally parallel with said undersurface, and a branch portion extending downwardly from said first leg to a position below the plane of said undersurface and an attachment leg of shorter length than said first leg and disposed in parallel spaced relation therebeneath, said attachment leg including a sharpened end portion adapted to be embedded into the material of said ceiling responsive to outward sliding movement of said mounting members in said guides, thereby clampingly to support said frame to said ceiling, said fixture including a reflector member and means for removably supporting said reflector member in said opening.

4,327,404
DC POWER SUPPLY CIRCUIT

Michiyuki Horiguchi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 9, 1980, Ser. No. 185,873
Claims priority, application Japan, Sep. 18, 1979, 54-129508[U]
Int. Cl.³ H02M 3/335
U.S. Cl. 363—19 5 Claims

1. A power supply circuit comprising:

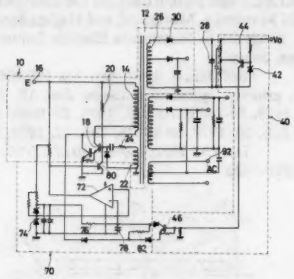
switching means for intermittently producing a DC power supply voltage;

smoothing means for smoothing the obtained DC voltage which is produced by said switching means;

activating means for driving said switching means in the self oscillation mode at the start of operation;

error detection means for detecting the difference between a preselected reference voltage level and the obtained and smoothed DC voltage level, and producing an error voltage in response thereto; and

control means responsive to an output signal of said error detection means for shortening the ON period of said switching means when said obtained and smoothed DC voltage is higher than said preselected reference voltage, and for lengthening the ON period of said switching means when said obtained and smoothed DC voltage is lower than said preselected reference voltage, said control means including variable resistance means connected to said error detection means and responsive to said error voltage for increasing the resistance of said variable resistance means when said obtained and smoothed DC voltage is lower than said preselected reference voltage and for decreasing the resistance of said variable resistance means when said obtained and smoothed DC voltage is higher than said preselected reference voltage; and

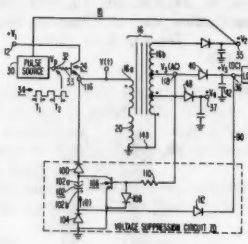


comparator means having one input terminal connected to said variable resistance means, another input terminal connected to a further reference potential, and an output terminal connected to said switching means for changing an output voltage at said output terminal in response to the increase and the decrease of said resistance of said variable resistance means, the changing output voltage shortening and lengthening the ON period of said switching means in response thereto.

4,327,405
VOLTAGE SUPPRESSION CIRCUIT FOR A DC-TO-DC VOLTAGE CONVERTER CIRCUIT

Charles A. Clark, Jr., Chatsworth, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed May 16, 1980, Ser. No. 150,285
Int. Cl.³ H02H 7/122; H02M 3/335
U.S. Cl. 363—56 3 Claims



1. An improved voltage converter of the type receptive of a d.c. input voltage including a transformer having primary and secondary windings, a d.c. output circuit coupled to said secondary winding for producing a d.c. output voltage of a first polarity, switching means for alternately coupling said d.c. voltage to said transformer primary for a first period and for decoupling said d.c. voltage from said transformer primary for a second period, the ratio of said first period to said second period being responsive to said d.c. output voltage, said primary winding, upon the decoupling of said d.c. input voltage thereto, producing a reversal of polarity and normally undesirably producing at one end of said primary winding, energy in

the form of a voltage spike of a second polarity opposite to said first polarity followed by a sustaining voltage having said second polarity and lower magnitude than said voltage spike, said lower magnitude being substantially equal to said d.c. output voltage, wherein the improvement comprises:

means coupled to said transformer primary winding for storing said voltage spike energy and for clamping said voltage at said one end of said primary winding to substantially said sustaining voltage; and

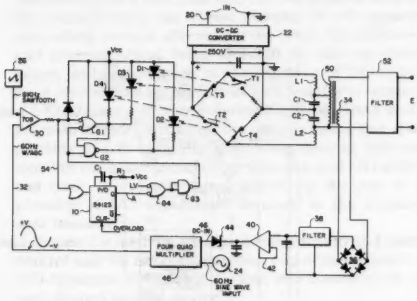
means coupled to said switching means and further coupled to said energy storage means for switchably applying energy stored in said energy storage means to said d.c. output circuit in response to and substantially simultaneously with the coupling of said d.c. input voltage to said transformer primary winding.

4,327,406

DC TO AC SYNTHESIZER WITH INVERTER CIRCUIT FAILURE AVOIDANCE

Albert H. Ashley, Holliston, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 1, 1980, Ser. No. 193,332
Int. Cl.³ H02H 7/122
U.S. Cl. 363—56 **2 Claims**



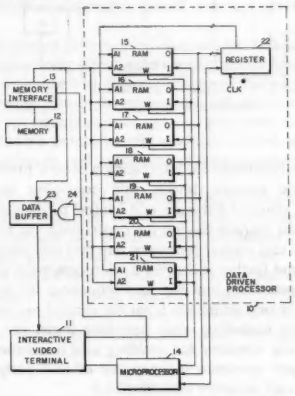
1. A D.C. to A.C. synthesizer system comprising a pulse width modulation device having a first high frequency sawtooth signal source wherein the sawtooth waveform comprises repetitive ramp signals rising from a lower to higher level at the start and close of an interval respectively, a second, lower frequency sinusoid signal source wherein its levels are between the levels of the said lower and higher levels of the said first signal source, a comparator device having the said first and second sources as inputs and having an output which is normally at a first logic value at the beginning of each said interval and changing to a second logic value when the first and second signals are equal, so that the pulse width at the output is representative of the amplitude of the second signal during each interval, and gate means coupled to said comparator output to supply the pulse width modulation to a DC-AC inverter means to convert direct current power to alternating current power at said lower second source frequency by demodulating said pulse width modulation which includes first high power solid state device switching means which in normal operation is "on" in response to said first logic value from the comparator and "off" in response to said second logic value; and second high power solid state device switching means which in normal operation is "on" in response to said second logic value and is "off" in response to said first logic value from the comparator; an inhibit of the gate means causes both the first and the second switching means to be "off", including means for protecting the components of said DC-AC inverter means from excessive power including monostable device having an input coupled to said output of the comparator, the monostable device having a timing period greater than said interval of the first signal, and being set by the leading edge of the comparator output and reset at the end of said timing period, the monostable device having an output coupled to said gate means to enable the gate means when it is in the set state and to inhibit the gate means when it is in the reset state to block the pulse width modulation and to maintain the signal to the inverter means in a safe state, whereby the monostable device remains normally in the set state and changes to the reset state upon failure of the output of the comparator to have a leading edge during said timing period and further including an overload line connected to a "clear" input of said monostable device, so that in response to an overload signal on said line the monostable device is held in its reset state to thereby inhibit said gate means.

4,327,407

DATA DRIVEN PROCESSOR

James L. Burrows, Merrimack, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 26, 1979, Ser. No. 15,278
Int. Cl.³ G06F 9/30; G11C 15/00
U.S. Cl. 364—200 **3 Claims**



1. Apparatus for processing binary information to locate predetermined sequences of characters amongst strings of characters in binary form being serially applied to an input of said apparatus from any data source comprising

a memory whose multi-bit addressing input is divided into multiple portions and binary words from different sources are applied to each of the multiple portions to make up a complete memory address which causes a binary word to be read out of said memory, said binary words read out of said memory being made up of all zeros or of ones and zeros, the latter being written into said memory to indicate said predetermined sequences of characters,

a register for storing ones of said binary words immediately after they are read out of said memory and applying a portion of whatever binary word is stored in said register to a first portion of said multiple portions of said memory addressing inputs to identify a block of bits in said memory said register only storing one binary word at a time and each binary word stored in said register being replaced by a subsequent binary word read out of said memory, and

means for applying said serial strings of characters in binary form to a second of said multiple portions of said memory addressing inputs to be searched for said predetermined sequences of characters, said predetermined sequences of characters being determined by binary words written into said memory before said strings of characters are applied to said second portion of said memory addressing inputs, each binary word being read out of said memory indicat-

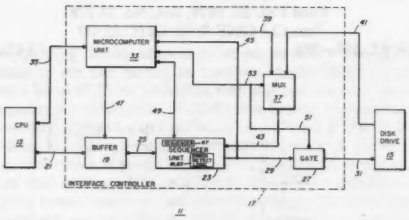
ing if the character in binary form presently being applied to said second portion of said memory addressing inputs in a character in proper character order in one of said predetermined sequences of characters.

4,327,408

CONTROLLER DEVICE WITH DIAGNOSTIC CAPABILITY FOR USE IN INTERFACING A CENTRAL PROCESSING UNIT WITH A PERIPHERAL STORAGE DEVICE

John M. Frissell, Dracut, and Kris E. Swanson, Grafton, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Apr. 17, 1979, Ser. No. 30,727
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—200 **17 Claims**



1. In a controller for interfacing a central processor unit to a peripheral storage device, said controller including a sequencer coupled between said central processor unit and said peripheral storage device for controlling the transfer of data between said central processor unit and said peripheral storage device and further including a microprocessor coupled to said central processor unit and said sequencer for controlling said sequencer on commands from the central processor unit, said sequencer including error detecting logic, the improvement comprising circuitry for enabling said controller to be tested for proper operation independent of said peripheral storage device, said circuitry including:

a. gating means coupled in the data path between said sequencer and said peripheral storage device and connected to said microprocessor for enabling or disabling the transfer of data to said peripheral storage device from said sequencer in response to commands from the central processor unit so as to place the controller either in a diagnostic mode or a normal operating mode,

b. means coupled to said microprocessor, said peripheral storage device and said sequencer for selecting output data from either said microprocessor or said peripheral storage device and transferring said output data to said sequencer on commands from the central processor unit for processing, and

c. means coupled between said microprocessor and said sequencer for transferring data from said sequencer to said microprocessor on commands from the central processor unit when said controller is in a diagnostic mode, said data representing control signals generated during normal operation of said sequencer, said microprocessor transferring said data to said central processor unit on command signals from said central processor unit for comparison with expected data,

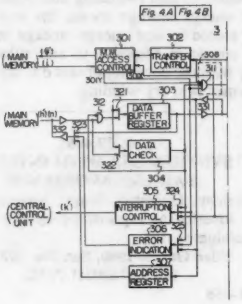
d. whereby, said peripheral storage device may be electrically disconnected from said sequencer and test signals sent to said sequencer from said microprocessor and to said microprocessor from said sequencer, allowing thereby said error detecting logic in said sequencer to be tested for proper operation.

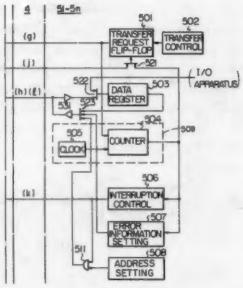
4,327,409

CONTROL SYSTEM FOR INPUT/OUTPUT APPARATUS

Minekazu Maruoka, and Tatsushi Hirotani, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 31, 1979, Ser. No. 71,084
Claims priority, application Japan, Sep. 8, 1978, 53-110508
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—200 **7 Claims**





1. A control system, for a plurality of I/O apparatuses, comprising:

a central control unit for generating an instruction signal;

a channel control device, operatively connected to said central control unit, for receiving said instruction signal, for providing a control information signal, a response signal, a request for transfer signal, a data signal, a request for memory access signal and an I/O address and error information signal, and for providing a request for interruption signal to said central control unit;

a main memory circuit, operatively connected to said central control unit and said channel control device, for receiving said request for memory access signal, said I/O address and error information signal, said request for transfer signal, and said data signal from said channel control device, and for providing said control information signal and a main memory response signal to said channel control device;

a common bus operatively connected to said channel control device;

a plurality of I/O apparatus controlling devices, operatively connected to said common bus, for receiving said control information signal and said response signal from said channel control device via said common bus, and for providing said request for transfer signal, said data signal, said request for interruption signal, and said I/O address and error information signal to said channel control device via said common bus,

each of the plurality of I/O apparatuses being operatively connected to one of said plurality of I/O apparatus controlling devices,

said plurality of I/O apparatus controlling devices controlling the plurality of I/O apparatuses in dependence upon said control information signal and said response signal provided by said channel control device to said plurality of I/O apparatus controlling devices, via said common bus,

each of said plurality of I/O apparatus controlling devices comprising supervising means for measuring the time between generation of said request for transfer signal and receipt of said response signal by the I/O apparatus controlling device, said supervising means including means for generating a time-out signal when the measured time exceeds a predetermined time, so that when data transfer between said main memory circuit and one of the plurality of I/O apparatuses, through said channel control device, said common bus and a corresponding one of said plurality of I/O apparatus controlling devices, is normal, said response signal is sent from said channel control device to the corresponding one of said plurality of I/O apparatus controlling devices, and when errors occur in data transfer between said main memory circuit and the one of the plurality of I/O apparatuses, through said channel control device, said common bus, and the corresponding one of said plurality of I/O apparatus controlling devices, no response signal is sent from said channel control device to the corresponding one of said plurality of I/O apparatus controlling devices affected by the error, the absence of said response signal being detected by said supervising means, and only the one of the plurality of I/O apparatuses involved in the erroneous data transfer is stopped,

said I/O address and error information signal being sent to the main memory circuit via the corresponding one of said plurality of I/O apparatus controlling devices, said common bus and said channel control device, said I/O address and error information signal identifying the one of the plurality of I/O apparatuses involved in the erroneous data transfer,

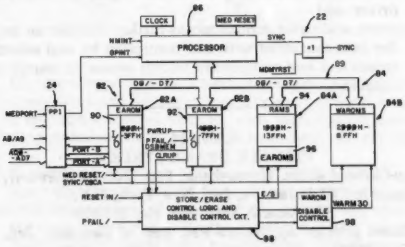
said request for interruption signal being sent to said central control unit via the corresponding one of said plurality of I/O apparatus controlling devices, said common bus, and said channel control device.

4,327,410

PROCESSOR AUTO-RECOVERY SYSTEM

Rameshchandra S. Patel, Kettering, Ohio, and Mark R. Easley, Cupertino, Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 26, 1980, Ser. No. 134,246
Int. Cl.³ G06F *11/00, 9/46, 13/00*
U.S. Cl. 364—200 **3 Claims**



1. A system for preserving data comprising:

a memory unit comprising first and second sections for storing data, said first section being volatile and said second section being non-volatile;

means for processing data being operatively coupled to said memory unit for processing said data; said processing means including a processor and a multiple nested interrupt service routine; and

means for controlling the transfer of said data between said first and second sections; said controlling means being responsive to the occurrence of a restore signal from said processing means during initialization to transfer said data from said second section to said first section; said controlling means also being responsive to an erase signal from said processing means during initialization to clear said data from said second section; said controlling means also being responsive to a power fail signal to transfer said data from said first section to said cleared second section;

said power fail signal indicating at least an impending power failure to said memory unit;

a first circuit means included in said controlling means for generating an interrupt signal in response to a said power fail signal;

said controlling means being responsive to a first said power fail signal to transfer said data from said first section to said cleared second section;

said first circuit means generating said interrupt signal in response to said first power fail signal to interrupt said processor at a first point in the processing of said data and also to initiate said multiple nested interrupt service routine;

said multiple nested interrupt service routine and said processing means being effective to condition said first circuit means by resetting it to respond to second and subsequent said power fail signals to produce second and subsequent said interrupt signals to interrupt said processor at second and subsequent points in said multiple nested interrupt service routine in said processing of data to preserve said data;

said processing means including means for storing the location at which said first point in the interruption of the processing of said data occurred and for storing the locations of said second and subsequent points; and

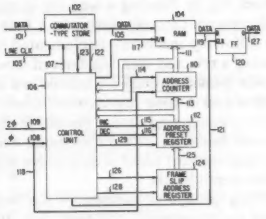
said multiple nested interrupt service routine and said processing means utilizing the locations in said storing means to return said processing of data to said first point in the absence of further subsequent said power fail signals.

4,327,411

HIGH CAPACITY ELASTIC STORE HAVING CONTINUOUSLY VARIABLE DELAY

Gary A. Turner, Newburyport, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 4, 1980, Ser. No. 127,262
Int. Cl.³ G06F *13/02, 13/06*
U.S. Cl. 364—900 **6 Claims**



1. An elastic store for receiving data bits at a variable line rate comprising

a first buffer store (**102**) having a number of storage cells (**201, 202, 203, 204**),

first means (**205, 206**) for writing in said data bits into said storage cells at said variable line rate, and

a second buffer store (**104**) having a number of addressable storage cells,

means for addressing (**110**) the storage cells in said second buffer,

characterized by

secod means (**513, 514, 515, 516, 517, 518, 519**) for reading out said data bits from said first buffer store and writing in said bits into addressed cells in said second buffer store at a given rate, the read-out cycle of said first buffer normally occurring subsequent to the write-in cycle of said first buffer,

third means (**513, 514, 519, 120**) for reading out said data from said second buffer store at a predetermined rate,

control means (**112**) for rendering variable the number of storage cells in said second buffer that are addressed, and

first buffer monitor means (**501, 502, 503, 504, 506**) for examining the phase between the read-out and write-in cycles of said first buffer and producing control signals when the phase drifts by a preselected amount, said control signals causing said given rate to increase or decrease depending upon the relative direction of said drift, said control signals further directing said control means to respectively increase or decrease the number of storage cells in said second buffer that are addressed.

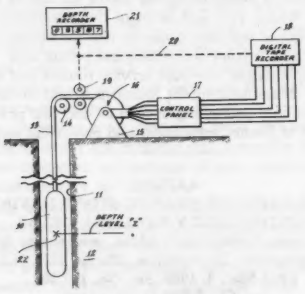
4,327,412
WELL LOGGING DATA PROCESSING TECHNIQUE

John P. Timmons, White Plains, N.Y., assignor to Schlumberger Limited, New York, N.Y.

Continuation of Ser. No. 276,347, Jul. 31, 1972, abandoned. This application Oct. 12, 1979, Ser. No. 84,125

Int. Cl.³ G06F *15/20, 15/31*

U.S. Cl. 364—422 **37 Claims**



1. In the art of well logging, a method of producing an improved well log by filtering a well log to reduce erroneous depth displacements thereof relative to a base well log comprising the following machine—implemented steps:

a. producing a selected well log derived from an investigating device passed through a borehole in a subsurface earth formation and a base log derived from the same or a different investigating device passed through the same or a different borehole in the formation, each of said logs comprising samples taken at successive initially indicated borehole depth levels;

b. combining groups of samples of the base log and the selected log to produce, for each of a succession of initially indicated borehole depth levels, a group of normalized indications of fit each of which is related to the degree of fit of a span of the base log and a span of the selected log at a respective depth displacement therebetween;

c. wherein the selected groups of samples of the base log associated with successive initially indicated borehole depth levels substantially overlap with each other in terms of borehole depth and the respective groups of normalized indications of fit similarly overlap each other in terms of borehole depth;

d. combining at least some of said groups of overlapping normalized indications of fit to produce improved groups of indications of fit; and

e. using said selected well log and said improved groups of indications of fit to filter erroneous depth displacements of the selected well log relative to the base well log and to produce a tangible representation of the resulting filtered selected log.

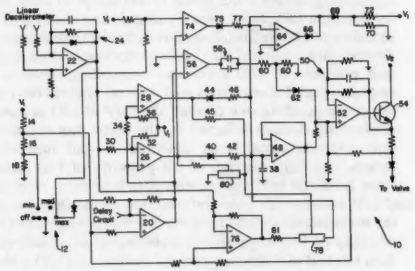
4,327,413
AUTOMATIC BRAKE CONTROL CIRCUIT FOR AIRCRAFT

Edgar J. Ruof, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Sep. 12, 1979, Ser. No. 74,691

Int. Cl.³ B60T *8/12*

U.S. Cl. 364—426 **9 Claims**



1. A control circuit for use in an automatic braking system for an aircraft, comprising:

selection means for selecting a desired rate of deceleration and producing a first output signal corresponding thereto;

deceleration sensing means for producing a second output signal corresponding to the actual rate of deceleration;

valve control means connected to said selection means and said deceleration sensing means for controlling brake pressure and forcing said actual rate of deceleration to asymptotically approach said desired rate of deceleration, said valve control means comprising a comparator circuit means connected to a valve driver and receiving and comparing said first and second output signals, said comparator circuit means further controlling the charge on a capacitor at selected rates of charging and discharging, said charge presenting a control signal to said valve driver; and

wherein said valve control means further includes an amplifier interconnected with and controlled by said selection means and said comparator circuit means to charge said capacitor.

4,327,414
VEHICLE BRAKE SYSTEM

Hans-Christof Klein, Hattersheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,827

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1979, 2926017

Int. Cl.³ B60T *8/08*

U.S. Cl. 364—426 **36 Claims**

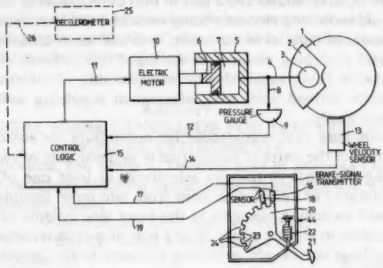
1. A vehicle brake system comprising:

an electronic control unit to provide a control signal;

a plurality of electrically controllable pressure modulators each coupled to said control unit and to a different brake actuating device responsive to said control signal for

controlling said brake actuating device associated therewith;

a brake pedal actuated brake-signal transmitter coupled to said control unit providing a first signal to said control unit representative of a desired value of vehicle deceleration; and

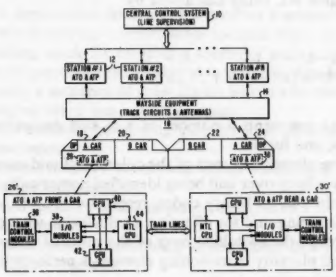


a decelerometer fastened to said vehicle and coupled to said control unit providing a second signal to said control unit representative of the actual value of vehicle deceleration, said control unit providing said control signal dependent on the difference between said first and second signals.

4,327,415
TRANSIT VEHICLE HANDBACK CONTROL APPARATUS AND METHOD

Donald L. Rush, Penn Hills; Robert H. Perry, Peters Township, Allegheny County, and Richard S. Rhoton, Mt. Lebanon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 31, 1980, Ser. No. 117,417
Int. Cl.³ B61L *27/00*
U.S. Cl. 364—436 **16 Claims**



1. In control apparatus for a train of vehicles operative with a roadway track and having at least a primary control vehicle and a secondary control vehicle, with each control vehicle including an automatic train control equipment, the combination of

first means provided in said primary control vehicle for receiving a control signal from the roadway track,

second means provided in each of said primary and secondary control vehicles, with the second means in said primary control vehicle being coupled with the first means in the primary control vehicle and providing an interface control connection between said primary control vehicle and said secondary control vehicle,

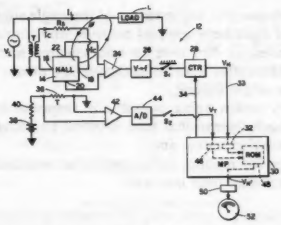
third means provided in each of the primary control vehicle and the secondary control vehicle, with the third means in the primary control vehicle being coupled with the second means in the primary control vehicle for selecting either a normal operation with the primary control vehicle controlling the train or a handback operation with the secondary control vehicle controlling the train,

with said second means including first signal means in each of the primary and secondary control vehicles and being energized in the primary vehicle for determining the secondary control vehicle to control the train for said handback operation, and with said second means including second signal means in each of the primary and secondary control vehicles and being energized in each of the primary and secondary control vehicles for enabling the secondary control vehicle to control the train for said handback operation.

4,327,416
TEMPERATURE COMPENSATION SYSTEM FOR HALL EFFECT ELEMENT

John W. Jerrim, Lilburn, Ga., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Apr. 16, 1980, Ser. No. 140,954
Int. Cl.³ G01R *33/06*
U.S. Cl. 364—481 **18 Claims**



1. A device for measuring the density of a magnetic flux field, comprising a Hall element for generating an output voltage as a function of a Hall element control current and the flux density of the magnetic field to which the element is exposed, said output voltage also being a function of Hall element temperature, means for measuring the temperature of said Hall element, memory means having storage locations containing Hall voltage compensation data as a function of Hall element temperature; means responsive to said temperature measuring means for generating a Hall temperature dependent digital signal, means for applying said temperature dependent digital signal as an address to said memory means to generate a correction voltage corresponding to the Hall element temperature, and means for combining said correction voltage with said Hall element output voltage to provide a temperature compensated output voltage.

4,327,417
ANTENNA SCAN PATTERN GENERATOR

Thomas E. Zaczek, Littleton, Colo., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Jun. 6, 1980, Ser. No. 157,104
Int. Cl.³ G01S *7/40*; G06F *15/20*
U.S. Cl. 364—578 **15 Claims**

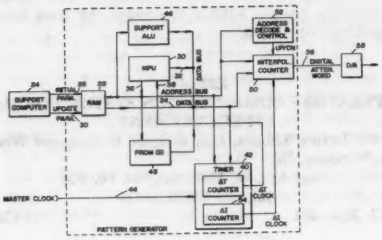
1. Apparatus for synthesizing in real time a sequence of signal attenuation values corresponding to the line of sight intersection of the surface envelope of a three dimensional antenna radiation beam pattern sensed by a receiver selectively positioned in space relative to an RF source emitting said radiation pattern, comprising:

addressable memory means having at least one stored data set of a two dimensional planar cut of a generalized typical radiation pattern having certain predetermined characteristics, said cut being defined in terms of signal attenuation values as a function of angle off of beam center (bore-

sight), and plural stored instruction sequences of a plurality of different scanning motions;

input means for inputting a set of operational parameter values for a desired type of antenna pattern which is symmetrical about boresight and which has a selected beamwidth and scanning motion;

signal processor means coupled to said input means and being responsive to said set of parameter values to sequentially address a selected one of said plural data sets in said memory means in successive operational time intervals to



generate respective angle values of the angle subtended by the line of sight between said receiver and source and the instant boresight direction for said selected scanning motion and thereafter address said memory means with said respective angle values;

said memory means being operable in response to said address in each operational time interval to provide a specific attenuation value; and

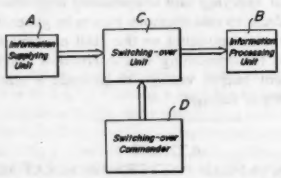
output means for reading out a specific attenuation value in each operational time interval.

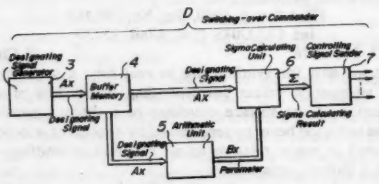
4,327,418

HIGH SPEED INFORMATION SELECTION AND TRANSFER SYSTEM

Norimasa Kishi, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 14, 1979, Ser. No. 103,480
Claims priority, application Japan, Jan. 5, 1979, 54-50
Int. Cl.³ H04Q 3/00
U.S. Cl. 364—715 **6 Claims**





1. A high speed information selection and transfer system, comprising:

an information supplying unit for supplying a plurality of information units which are identified by a plurality of binary codes of n bits, respectively;

a switching over unit comprising a plurality of switching elements arranged in a matrix and connected with each other between successive columns of said matrix, each element being provided with a pair of input terminals and a pair of output terminals, a connection between said pair of input terminals and a pair of output terminals in each of said switching elements being switched over between two states of parallel and crossing, and said input terminals of said switching element in the input side column of said matrix being supplied with said plurality of information units derived from said information supplying unit, respectively;

a switching over commander for controlling the switching over of the states of connection in said plurality of switching elements to transfer selectively at least one of said plurality of information units from said input terminals of said switching elements in the input side column of said matrix to at least either of said pair of output terminals of at least one of said switching elements in the output side column of said matrix;

said switching over commander comprising:

a designated signal unit for forming a designating signal Ax, which is used for designating said switching elements to be switched over as:

$$Ax=(a_{n-1}a_{n-2}, \ldots, a_i, \ldots, a_1, a_0);$$

a buffer memory for storing said designating signal Ax in a predetermined time duration,

an arithmetic unit for effecting a calculation whereby, according to a result of comparison between i-th order bits of binary codes which identify desired information to be selected out of said plurality of information units, respectively, $a_i=0$ if all of said i-th order bits are "0", $a_i=1$ if all of said i-th order bits are "1", and $a_i=x$ if said i-th order bits are different from each other, and a parameter b_i, which represents a position of the symbol x in said designating signal Ax, being calculated by:

$$b_i = \begin{cases} \beta_i - i (i = 0, 1, 2, \ldots, |x| - 1) \\ 0 \ (i = |x|, |x| + 1, \ldots, n - 1) \end{cases}$$

where $|x|$ represents a number of x in said designating signal Ax, and further

the switching elements in each of the columns of said matrix of said switching-over unit being identified numerically by another plurality of binary codes, respectively,

a sigma calculating unit for effecting a calculation whereby the control of the switching over of the states of connection in said plurality of switching element is performed in such a manner that

with respect to the switching elements in the i-th column of said matrix of said switching-over unit:

if $a_i=0$, the states of connection in the switching elements, which are numbered by the binary codes the b_i-th order bits of which binary codes are "1", are switched over,

if $a_i=1$, initially, the states of connection in all of said switching elements in said i-th column of said matrix are switched over, and then the states of connection in the switching elements, which are numbered by the binary codes the b_i-th order figures of which binary codes are "1", are switched over, and

if $a_i=x$, initially, the states of connection in the switching elements, which are numbered by the binary codes the n-b_i-th order figures of which binary codes are "1", where the symbol z represents the value of the symbol x positioned between the terms a_0 and a_{z-1} of said designating signal Ax, are switched over, and then the states of connection in the switching elements, which are numbered by

the binary codes the b_p-th order figures of which binary codes are "1", are switched over, and

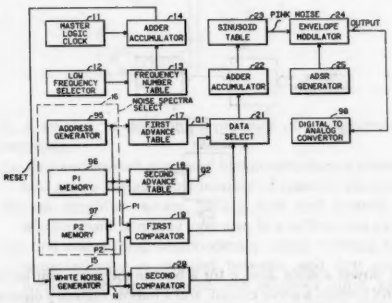
a controlling signal sender for setting the state of connection of said plurality of switching elements in said switching over unit in response to the result of the calculation effected by said sigma calculating unit; and

an information processing unit for processing the information units derived from said switching over unit with a plurality of input terminals which correspond in order to said output terminals of the switching elements in the output side column of the matrix.

4,327,419
DIGITAL NOISE GENERATOR FOR ELECTRONIC MUSICAL INSTRUMENTS

Ralph Deutsch, and Leslie J. Deutsch, both of Sherman Oaks, Calif., assignors to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Feb. 22, 1980, Ser. No. 123,632
Int. Cl.³ G06F *15/31*; G10H *1/00*
U.S. Cl. 364—717 **16 Claims**



1. A digital noise generator for creating a sequence of digital data words having a controllable spectral shape comprising;

a timing clock for creating a source of timing signals,

a noise generator responsive to said timing signals for generating a sequence of noise digital words wherein each noise digital word has a random value,

a first memory containing stored values of a first advance increment,

a second memory containing stored values of a second advance increment,

a third memory containing stored values of a first comparison constant

a fourth memory containing stored values of a second comparison constant,

a spectral select means providing addressing signals for addressing out a first advance increment value from said first memory, a second advance increment value from said second memory, a first comparison constant from said third memory, and a second comparison constant from said fourth memory,

a first comparator means responsive to said addressed out first comparison constant and said noise digital word whereby a first comparison signal is generated if said noise digital word is larger in value than said first comparison constant,

a second comparator means responsive to said addressed out second comparison constant and said noise digital word whereby a second comparison signal is generated if said noise digital word is larger in value than said second comparison signal,

a data select means responsive to said first comparison signal and to said second comparison signal whereby a selection is made of either said first advance increment value addressed out from said first memory or said second advance increment value addressed out from said second memory,

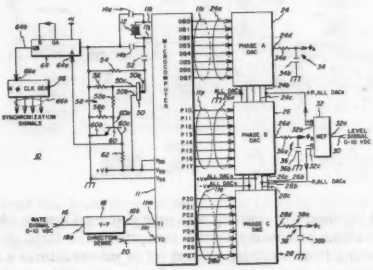
a fifth memory means containing stored output data values, and

a memory addressing means responsive to said selection from said data select means for addressing output data values from said fifth memory means thereby creating said sequence of digital data words having a controllable spectral shape.

4,327,420
POLYPHASE REFERENCE GENERATOR

Michael Gdula, Albany; Raymond J. Hodsoll, Saratoga, and Edwin C. Underkoffler, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,259
Int. Cl.³ G06F *15/31*; H03B *19/00*
U.S. Cl. 364—721 **10 Claims**



1. A reference generator for providing a plurality of differently phased output waveforms, each of preselected waveshape and amplitude, comprising:

a plurality of data output ports equal in number to the number of said output waveforms;

memory means for storing a lookup-table of step-wise approximations of the amplitudes of a complete repetition of each of the plurality of waveform phases, each step-wise approximation being stored as digital data at a uniquely addressed location and retrievable therefrom;

a timing register having an input for receiving an external signal to increment the count in said timing register, and having, upon commencement of operation, the count therein initialized with the address of the first location of said lookup-table for a first one of said plurality of waveform phases;

a plurality of addressable data registers, including an accumulator register for adding data from preselected ones of said plurality of addressable data registers to the digital count then presently contained in said timing register; each resulting number being provided by said accumulator register to said memory means as respective addresses of addressable locations therein at which are stored corresponding step-wise waveform approximation data for a present value of each of the remaining respective phases of said output waveforms;

means receiving a rate signal for providing said external signal to said timing register input for advancing the count stored therein to determine at any particular time the address in said lookup-table of said memory means and to cause said memory means to provide the first output waveform address;

said memory means providing the data stored at said first output waveform address to said first one of said plurality of output ports;

said memory means also sequentially providing said waveform approximation data to that one of said plurality of output ports associated with that one of said output phase

signals for which a present memory means address was provided; and

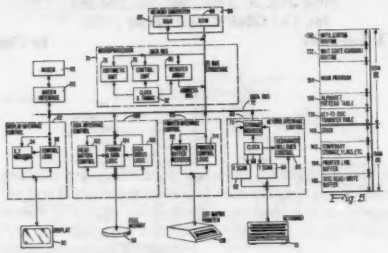
a plurality of means equal in number to the number of output waveform phases, each receiving the digital data from an associated one of said plurality of output ports for providing an analog voltage of magnitude established at least in part by the digital data then being received.

4,327,421

CHINESE PRINTING SYSTEM

Gary Y. Wang, Wellesley, Mass., assignor to Transtech International Corporation, Wellesley, Mass.

Filed May 13, 1976, Ser. No. 686,216
Int. Cl.[3] G06F *3/09;* B41J *5/00*
U.S. Cl. 364—900 **15 Claims**



1. A method for entering and reproducing Chinese characters in a data processing system comprising the steps of:

selecting from a predetermined set of sub-structures a series of one or more sub-structures for forming Chinese characters which define a character to be entered;

entering the selected sub-structures into the data processing system by typing selected keys of a keyboard having a plurality of keys each for indicating a respective one of said predetermined set of sub-structures from which characters to be entered can be composed, the keys of said keyboard being manually actuable to indicate the corresponding sub-structure;

the entering step further including the steps of an actual Chinese writing sequence comprising:

first, entering sub-structures sequentially as they occur in a character or sub-structure from left to right;

next, entering sub-structures sequentially as they occur in a character or sub-structure from top to bottom; and

next, entering sub-structures sequentially as they occur in a character or sub-structure from outside to inside; and

providing a plurality of sub-structured data sets stored in the data processing system representing sub-structure sequences corresponding with individual Chinese characters;

providing a plurality of second data sets stored in the data processing system, each corresponding with a respective one of the sub-structure data sets and each of the second data sets representing the actual form of the Chinese character to be reproduced;

determining when a complete series of sub-structures defining a character has been entered;

comparing the entered, complete sub-structure series with the stored sub-structure data sets representing sub-structure sequences corresponding with individual Chinese characters;

providing a first signal indication upon detection of a match between the entered sub-structure series and one of the stored sub-structure data sets representing sub-structure sequences;

providing a second signal indication if no sub-structure data set is found in said stored sub-structure data sets which matches the substructure series entered; and

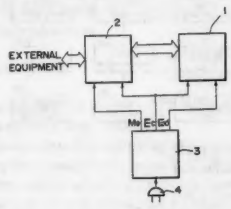
reproducing in response to said first signal indication and the stored sub-structure data set which matches the entered sub-structure series the Chinese character in the form represented by the second data set which corresponds to the stored sub-structure data set matched to the entered sub-structure series.

4,327,422

POWER SOURCE DEVICE FOR BUBBLE MEMORY UNIT

Ryoji Imazeki, and Masayuki Hattori, both of Hachioji, Japan, assignors to Fujitsu Fanuc Limited, Japan

Filed Jul. 17, 1980, Ser. No. 169,791
Claims priority, application Japan, Jul. 19, 1979, 54-091998
Int. Cl.[3] G11C *19/08;* H04B *17/00*
U.S. Cl. 365—1 **17 Claims**



1. A power source device for a bubble memory unit having a control circuit, a drive circuit, and a bubble memory element, said power source device for supplying a first DC voltage signal E_c which is applied to the control circuit for controlling the reading and writing of data, a second DC voltage signal E_d which is applied to the drive circuit for driving the bubble memory element, and a memory enable signal M_e which enables data to be written in the bubble memory element or read out therefrom, the signals E_c, E_d and M_e being made to rise and fall according to a prescribed sequence as a commercial power supply is connected and disconnected, said power source device comprising:

a first DC power source circuit, coupled to the commercial power supply, for generating a reference level voltage V_M and said first DC voltage signal E_c;

a second DC power source circuit, coupled to the commercial power supply, for generating said second DC voltage signal E_d;

a comparator circuit for comparing the magnitude of said first DC voltage signal E_c with said reference level voltage V_M and for generating a comparison signal;

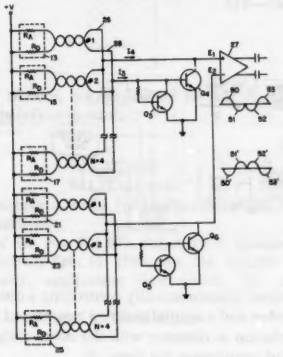
signal generating means, coupled to said comparator circuit, for generating the memory enable signal M_e; and

delay means for delaying said comparison signal and for providing a power enable signal P_e, corresponding to the delayed comparison signal, to said second DC power source circuit; wherein when the commercial power supply has been connected, and after the lapse of time until the comparison signal indicates that the magnitude of said first DC voltage signal E_c surpasses the reference level voltage V_M, said delay means generating said power enable signal P_e, said power enable signal P_e actuating said second DC power source circuit so that said second DC voltage signal E_d is generated and thereafter said signal generating means generates the memory enable signal M_e.

4,327,423
MAGNETIC BUBBLE TRANSDUCER

Joseph V. Reymersdal, Fairless Hills, Pa., and John H. Cooper, San Jose, Calif., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 21, 1980, Ser. No. 170,344
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—8 **5 Claims**



1. A system for detecting a presence of a magnetic bubble comprising:

(a) first and second groups of bubble detectors wherein each said group has an equal number of resistive detectors;

(b) an amplifier means having first and second inputs wherein said amplifier operates in a differential mode;

(c) first and second semiconductor means wherein the first semiconductor is coupled between said first group of bubble detectors and one said amplifier input, and said second semiconductor means is coupled between said second group of bubble detectors and the other said amplifier input,

(d) said semiconductor means directly converting a resistance change within one said resistive detectors due to a presence of a magnetic bubble into a direct change of voltage.

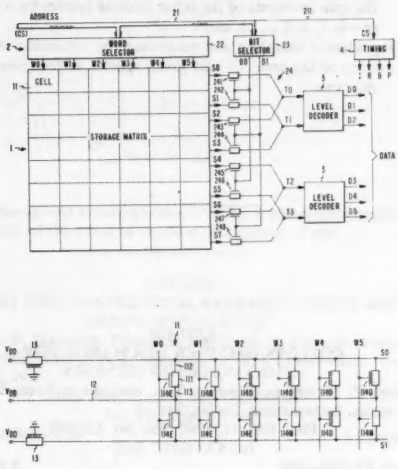
4,327,424
READ-ONLY STORAGE USING ENHANCEMENT-MODE, DEPLETION-MODE OR OMITTED GATE FIELD-EFFECT TRANSISTORS

Philip T. Wu, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 17, 1980, Ser. No. 169,542
Int. Cl.³ G11C *17/00, 11/40*
U.S. Cl. 365—104 **6 Claims**

1. A read-only storage, comprising:

a storage matrix having a number of cells each comprising a field-effect transistor having one of three different gate configurations, said configurations including an enhancement-mode gate, a depletion-mode gate and no gate, said cells being capable of producing three-level signals depending upon said gate configurations; and

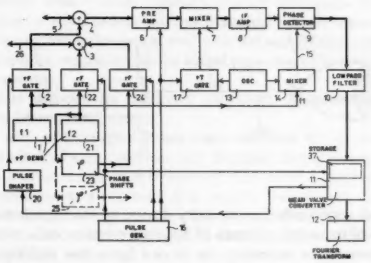


at least one level decoder responsive to a pair of said three-level signals for producing a triplet of two-level data signals.

4,327,425
METHOD FOR THE RECORDING OF SPIN RESONANCE SPECTRA AND AN APPARATUS FOR THE IMPLEMENTATION OF SUCH METHOD

Richard R. Ernst, Winterthur, and Walter P. Aue, Zürich, both of Switzerland, assignors to Spectrospin AG, Switzerland

Filed Jul. 25, 1979, Ser. No. 60,286
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1978, 2833653
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—152 **11 Claims**



1. A method for determining the spin resonance spectra of a selected nuclear species in a sample comprising the steps of

applying a pulsed rf signal of a frequency f_1 to said sample located in a magnetic field to excite the spin of at least said selected species,

applying to said sample an rf frequency decoupling signal having a frequency f_2 different from that of f_1, said decoupling signal consisting of a periodic sequence of pulse groups at least in part occurring after the application of the rf signal of frequency f_1, said pulse groups comprising several pulses, the pulses being so short that the frequency mixture detectable in the pulses according to the Fourier

analysis covers the entire range of spin resonances at least of the nuclear species other than said given species, and that the pulses of a pulse group causes a total rotation of the spin momenta of the other nuclear species by $n \times 360°$ ($n=0, 1, 2, 3 \ldots$), and

repetitively sampling and recording the relaxation oscillations of the spins of said given species at predetermined intervals.

4,327,426

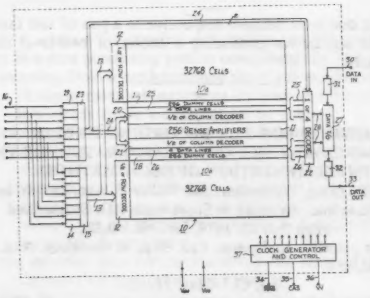
COLUMN DECODER DISCHARGE FOR SEMICONDUCTOR MEMORY

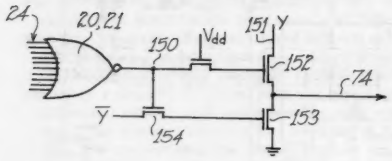
Hugh P. McAdams, Houston, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.

Filed Feb. 11, 1980, Ser. No. 120,595

Int. Cl.³ G11C *7/02*

U.S. Cl. 365—203 **9 Claims**





1. A semiconductor memory device of the type having an array of rows and columns of dynamic memory cells, comprising: means for accessing the device by a row address along with a column address, said means including a row decoder and a column decoder, the column decoder having a plurality of output lines, clock voltage means for applying a logic voltage to each output line is selected, and means for discharging said output lines when not selected by the column decoder to prevent unwanted buildup of voltage thereon, said means for discharging including a first transistor having source-drain path connected between each output line and reference potential and having a gate connected to a complement of said clock voltage means through the source-drain path of a second transistor which has its gate connected to the column decoder output.

4,327,427

SYSTEM OF AUTOMATICALLY CONTROLLING DISTANCE IN LINEAR MOVEMENT

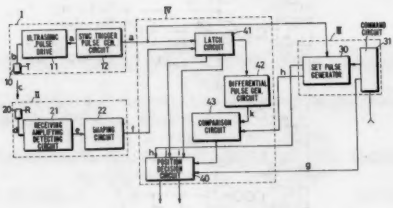
Mitsuhiko Hotta; Akifumi Tachibana, both of Kyoto, and Takanori Shigihara, Hyogo, all of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Jul. 3, 1980, Ser. No. 165,387

Claims priority, application Japan, Jul. 4, 1979, 54-85320

Int. Cl.³ G01S *11/00*

U.S. Cl. 367—118 **9 Claims**



1. A method of automatically controlling a distance between a first member and a second member one placed in a relatively variable relation in distance with the other on a straight line, said method comprising the steps of:

(a) disposing an ultrasonic transmitter and an ultrasonic receiver in a mutually opposed relation on a straight line so as to interlock with the linear movement;

(b) emitting an ultrasonic pulse from said transmitter to said receiver and receiving the pulse by the receiver;

(c) detecting the ultrasonic pulse received and generating a receiving pulse by an electrical means;

(d) generating a set pulse lagging for a period of time calculated in terms of time required for an ultrasonic pulse to propagate to a desired distance between said two members in synchronims with generation of the ultrasonic pulse from said transmitter;

(e) comparing the arrival time of said receiving pulse with that of a set pulse by an electrical means;

(f) generating a decision signal for deciding the distance between the transmitter and the receiver by said comparison in terms of distance toward and away from a desired distance; and

(g) controlling the distance between said two members to the desired distance in accordance with said decision signal.

4,327,428

DECORATIVE PLATE FOR A TIMEPIECE

Tadao Enomoto, Higashimurayama, and Hiroshi Koide, Tokyo, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Jan. 30, 1979, Ser. No. 7,704

Claims priority, application Japan, Jan. 30, 1978, 53-9018; Feb. 15, 1978, 53-17088[U]

Int. Cl.³ G04B *19/06*; B23P *23/00*; B41C *3/08*

U.S. Cl. 368—232 **14 Claims**

1. A method of forming a decorative plate for a timepiece, comprising the steps of:

(a) preparing a pattern forming base material having a predetermined contoured surface pattern;

(b) transferring said predetermined contoured surface pattern to an electroforming matrix;

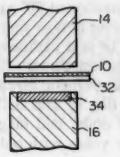
(c) flash plating a nickel alyer on said electroforming matrix;

(d) passivation treating said nickel layer to form a passivation layer;

(e) electroforming a mold on said passivation layer;

(f) stripping said mold from said passivation layer; and

(g) embossing a blank sheet of material with said mold to form said decorative plate having a decorative pattern



embossed thereon corresponding to said predetermined contoured surface pattern.

4,327,429

WATCHCASE

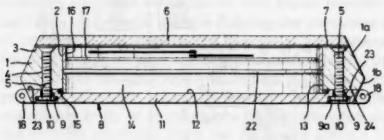
Hans U. Klingenberg, 3274 St. Niklaus bei Merzligen, Canton of Berne, Switzerland

Continuation of Ser. No. 921,607, Jul. 3, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 120,324

Claims priority, application Switzerland, Jul. 15, 1977, 8813/77

Int. Cl.³ G04B *37/00*

U.S. Cl. 368—294 **5 Claims**



1. A watchcase comprising an annular frustoconical caseband have a top flat annular surface, a glass made of a transparent material having a flat bottom annular surface complementary to the annular surface of the caseband, said glass and said caseband being of materials of substantially the same hardness and substantially the same coefficient of thermal expansion and both having faceted side faces, said complementary flat surfaces being cemented together with said faceted surfaces in mutual registry to form an integral main member, no portion of said caseband traversing the plane of said cemented surfaces, and a bottom removably secured to said main member.

4,327,430

INFORMATION SIGNAL RECORDING MEDIUM OF ROTARY TYPE WITH OVERLAPPED TRACKS

Yoshiyo Wada; Hisao Kinjo, both of Yokohama, and Ichiro Ueno, Isehara, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

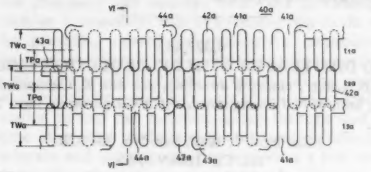
Continuation of Ser. No. 876,558, Feb. 9, 1978, abandoned. This application Jul. 6, 1979, Ser. No. 55,752

Claims priority, application Japan, Feb. 9, 1977, 52-13322; Feb. 12, 1977, 52-14438; Feb. 14, 1977, 52-14870; Feb. 23, 1977, 52-18056

Int. Cl.³ H04N *5/80*; G11B *11/00*

U.S. Cl. 369—43 **1 Claim**

1. An information signal recording medium of rotary type free of a guide groove on a flat surface with first successions of pits formed therein as respective concavities in response to a television composite video signal and with second successions of pits formed therein as respective concavities in response to a reference signal for tracking, said first successions of pits forming tracks of a specific pitch, each pit being formed with a width, equal to the width of a track, which is substantially greater than said pitch of the tracks, said second successions of pits being formed at positions substantially intermediate between the centerlines of adjacent tracks formed by the first successions of pits with partial overlap on the first successions of pits said medium being arranged for tracing by a reproducing stylus having a sliding contact whose width is greater than the width of the track of the first successions of pits.



4,327,431

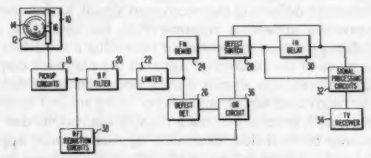
VIDEO DISC PLAYER WITH VARIABLE OFFSET RFI REDUCTION CIRCUIT

Charles B. Dieterich, Princeton, and Frank B. Lang, Princeton Junction, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 7, 1980, Ser. No. 204,827

Int. Cl.³ H04N *5/80*

U.S. Cl. 369—126 **3 Claims**



1. In a video disc player of the type having: pickup apparatus for recovering an information signal recorded on a disc in the form of a modulated carrier signal; demodulation apparatus; defect detection apparatus for detecting defects in the recovered signal; and defect compensation apparatus responsive to the operation of the defect detection apparatus for providing a substitute signal in place of the recovered signal in the playback display of said information signals during occurrences of defects in the recovered signal; said player being subject to interference with normal playback display operations due to the pickup of unrecorded, externally applied signals; apparatus for reducing the influence of said external signals comprising:

an amplifier responsive to the signal provided by said pickup apparatus;

a signal detector for detecting amplitude variations in the amplifier output signal;

first and second conductive paths coupled to an output terminal of said detector, said first path being responsive to a wide band of frequencies, said second path being responsive to a relatively low band of frequencies, one of said paths having a means for providing a variable d.c. offset, said offset varying as a function of said detected amplitude variations;

said means for providing a variable d.c. offset comprising: an integrator circuit responsive the output of said detector; a transistor having a base electrode coupled to said integrator circuit, a collector electrode coupled to one end of a load resistor and an emitter electrode coupled to a point of reference potential; the other end of said load resistor being coupled to an output terminal of said signal detector; and said collector electrode being connected to said first conductive path;

a voltage comparator coupled to said first and second paths for providing an output signal in response to a detected signal having an amplitude greater than said offset voltage

and a frequency higher than said low band of frequencies; and

means coupling said comparator output signal to said defect compensation apparatus.

4,327,432

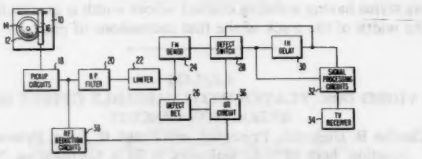
VIDEO DISC PLAYER WITH RFI REDUCTION CIRCUIT

Frank B. Lang, Princeton Junction, and Jon K. Clemens, Skillman, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 7, 1980, Ser. No. 204,828

Int. Cl.³ H04N *5/80*

U.S. Cl. 369—126 **8 Claims**



1. In a video disc player of the type having:

pickup apparatus for recovering an information signal recorded on a disc in the form of a modulated carrier signal; demodulation apparatus; defect detection apparatus for detecting defects in the recovered signal; and defect compensation apparatus responsive to the operation of the defect detection apparatus for providing a substitute signal in place of the recovered signal in the playback display of said information signals during occurrences of defects in the recovered signal; said player being subject to interference with normal playback display operations due to the pickup of recorded, externally applied signals; apparatus for reducing the influence of said external signals comprising:

circuit means connected in parallel with said defect detection apparatus between an output terminal of said pickup apparatus and an input terminal of said defect compensation apparatus and responsive to the amplitude and frequency of the signal provided by said pickup apparatus for actuating said defect compensation apparatus for reducing the influence of said externally applied signals in the playback display.

4,327,433

MAGNETIC PHONO CARTRIDGE

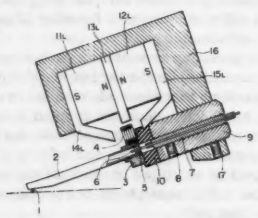
Keniti Okura, and Kazuo Nishikawa, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 25, 1980, Ser. No. 191,059

Claims priority, application Japan, Sep. 25, 1979, 54-121946; Sep. 25, 1979, 54-121947

Int. Cl.³ G11B *3/30*

U.S. Cl. 369—139 **8 Claims**



1. A pick-up phono cartridge comprising: a vibrating system comprising a non-magnetic vibrating body secured to a base end of a cantilever having a stylus at the other end thereof; first and second hollow coils having winding axes parallel to said cantilever and secured to said vibrating body, said first and second hollow coils being mounted on said non-magnetic vibrating body and positioned 90° apart from one another so that said first and second hollow coils are each disposed apart from the center axis of said cantilever, said vibrating system being vibratable around the center axis of said cantilever in said vibrating body; and a magnetic circuit for applying magnetic flux to the outer portion of said hollow coils normal to said winding axes of said coils, said magnetic circuit comprising front, center and rear yokes with poles, a line defined by said side poles being substantially arranged in parallel to the center axis of said cantilever, said center pole being arranged outside of the outer periphery of said coils and said front and rear poles being positioned outside of said coils so as to face each end of said coils.

4,327,434

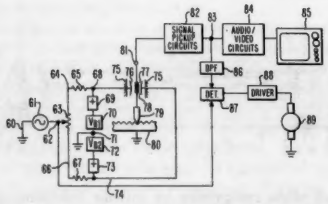
VIDEO DISC STYLUS POSITION SENSOR SYSTEM

Todd J. Christopher, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 28, 1980, Ser. No. 116,249

Int. Cl.³ G11B *17/06*

U.S. Cl. 369—220 **10 Claims**



1. A video disc stylus position sensor system of the type having a signal pickup stylus secured to a stylus arm, said stylus arm being compliantly mounted in a carriage assembly for translating the pickup stylus radially across a record disc and permitting relative movement between the pickup stylus and the carriage assembly, said sensor system having first and second variable capacitors formed by first and second electrodes secured to the carriage assembly and a third electrode disposed therebetween, said third electrode forming one plate of both said first and said second capacitors and having a fixed relation to said pickup stylus, and wherein the position of the stylus is determined by the resultant composite signal generated at the third electrode, said resultant composite signal being derived from the coupling of signals applied to said first and second electrodes through the capacitance of the variable capacitors wherein the improvement comprises:

means for providing a time varying signal of substantially constant amplitude;

first and second impedance means connected respectively between the means for providing the time varying signal and said first and second electrode;

a first voltage variable impedance means connected between said first electrode and a point of fixed potential, said first voltage variable impedance means increasing in value for increasing potential of a given polarity applied to the first electrode; and

a second voltage variable impedance means connected between said second electrode and a point of fixed potential, said second voltage variable impedance means decreasing in value for increasing potential of said given polarity applied to the second electrode, said first voltage variable impedance means causing an amplitude modulation of the signal applied to the first electrode complementary to an

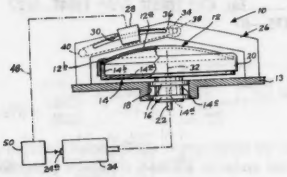
amplitude modulation caused by the second voltage variable impedance of the signal applied to the second electrode.

4,327,435

PLAYBACK SYSTEM FOR RECORDING DISK HAVING FLEXIBLE, DEFORMABLE RECORDING MEMBRANE

George S. Fenn, Box 8, Henderer Rd., Elkton, Oreg. 97436

Filed Feb. 1, 1980, Ser. No. 117,638
Int. Cl.³ G11B *25/00*
U.S. Cl. 369—261 **10 Claims**



1. Apparatus for reading information recorded on a particular side of a wafer-like rotary data-storage element, which element is axially deformable into a particular non-planar body of revolution, said apparatus including

a frame member,

a turntable rotatably mounted on said frame member and including a particular surface defining the particular body of revolution and constructed to receive the element,

deforming means located adjacent said turntable and operable, with the element received on said particular surface, produces a force to deform the element into the particular non-planar body of revolution with the recorded side of the element displaced from the particular surface of the turntable,

a head constructed for reading information recorded on the particular side of the element,

means responsive to signals produced by the head for controlling the force produced by the deforming means on the wafer-like element to maintain the element in the particular non-planar body of revolution, and

means mounting said head on said frame member for movement radially relative to the rotational axis of said turntable a substantially constant distance from the recorded side of the element.

4,327,436

SIGNAL MONITORING AND CONTROLLING SYSTEM IN A TIME DIVISION SWITCHING SYSTEM

Susumu Ohara, Yokosuka; Akira Horiki, Yokohama; Katsuyuki Miyazaki, Yokohama, and Kaoru Tokunaga, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 8, 1978, Ser. No. 967,846
Claims priority, application Japan, Dec. 9, 1977, 52/147044; Dec. 9, 1977, 52/147045; Dec. 9, 1977, 52/147046
Int. Cl.³ H04J *3/12*
U.S. Cl. 370—110.1 **3 Claims**

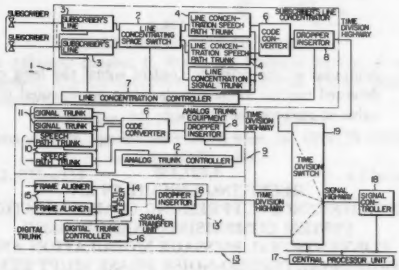
1. A signal monitoring and controlling system in a time division switching system for switching digital coded information, comprising:

a plurality of line interface means for monitoring and controlling status of lines;

a time division switch connected with said line interface means by signal time slots;

a signal controller connected with said time division switch by said signal time slots; and

a central processor unit connected with said time division switch and said signal controller whereby, in a receiving mode, said signal controller includes means for receiving multiplex monitor information from the time division switch representing the status of said lines from said line interface means and means for transferring said monitor information to said central processor unit after demultiplexing said multiplex monitor information, and said central processor unit includes means for processing said monitor information, and, in a transmitting mode, means for providing control information for controlling the status of said lines to said signal controller in accordance with said monitor information, and said signal controller further includes means for transmitting said control information to said line interface means through said signal time slots after multiplexing said control information, wherein said signal controller comprises a first memory for storing plural pieces of control information read out from said central processor unit, a second memory for storing a plurality of control words for processing said control information pieces, a first counter for reading out



said control words in synchronism with said signal time slots, a first arithmetic circuit including means for processing said control information pieces in accordance with said control words in a manner so that said control information pieces are classified into a cyclic signal needing renewal by transmitting a correct state with predetermined intervals and a random signal needing randomly a change of a state, a third memory for storing said classified control information pieces, and means for transmitting said classified control information pieces in a manner so that said classified control information pieces are read out at a given time with different transmitting time regions for said cyclic and random signals and multiplexed on said signal time slots by using a multi-frame technique whereby said cyclic and random signals are transmitted to said line interface means through a single signal time slot.

4,327,437

RECONFIGURING REDUNDANCY MANAGEMENT

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Hendrik J. C. Gelderloos, Largo, Fla.

Filed Jul. 30, 1980, Ser. No. 173,518
Int. Cl.³ G06F *11/18;* G05B *23/02*
U.S. Cl. 371—68 **18 Claims**

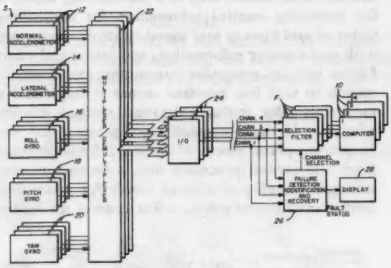
1. An apparatus for selecting a primary control signal for redundancy management in a system having a plurality of sensors providing input signals in parallel to a control computer to provide the computer with a primary control signal representing an output from a properly operating sensor, comprising:

(a) selector means for receiving and comparing input signals in groups of three from the sensors and detecting the median value signal of the three input signals;

(b) comparator means for comparing the detected median value signals to detemine if any one of the detected median value signals exceeds the others by an amount greater than the signal level for a failed sensor;

(c) said comparator means further including means for transmitting to the control computer as the primary control

signal a detector median value signal which exceeds the others by an amount greater than the signal level for a failed sensor and means for transmitting to the control



computer as the primary control signal the least of the detected median value signals when no detected median value so exceeds the others.

4,327,438

RECEIVING CIRCUIT IN AN INTERFERENCE-SUPPRESSING COMMUNICATIONS SYSTEM COMPRISING NARROW-BAND CONVENTIONAL MESSAGE MODULATION AND ADDITIONAL PSEUDO-NOISE PHASE SHIFT KEYING

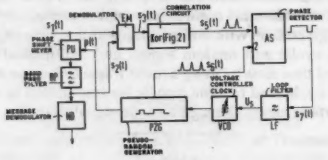
Paul W. Baier; Klaus Dostert; Madhukar Pandit, and Reinhard Simons, all of Kaiserslautern, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 12, 1979, Ser. No. 102,644

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1978, 2854832

Int. Cl.³ H04L *7/00*

U.S. Cl. 375—1 **7 Claims**



1. In a receiving circuit for an interference-suppressing communications system of the type having a narrow band conventional message modulation and additional pseudo-noise phase-shift keying, the receiving circuit comprising a pseudo-random generator whose continuous pseudo-random sequence conforms with the transmitting side pseudo-random sequence and consists of a pseudo-random combination of the binary values L and H in a fixed clock pulse scheme and which actuates a phase-shift keying element cancelling the phase shift modulation produced at the transmitting side, a correlation circuit for producing a correlation pulse which appears when the pseudo-random sequence of the received signal reaches a specified location of the pseudo-random code or when the correlation integral of the pseudo-random sequence of the received signal and the pseudo-random sequence produced at the receiving side reaches a maximum, the improvement therein comprising:

a demodulator connected to receive the entire message modulated and pseudo-random phase-shifted signal and to receive a signal which contains only the message modulated signal and providing a demodulated signal which contains only the pseudo-random phase-shift modulation to the correlation circuit.

4,327,439

METHOD FOR GENERATING MODEM TRANSMISSION SIGNALS WITH QUADRATURE AMPLITUDE MODULATION

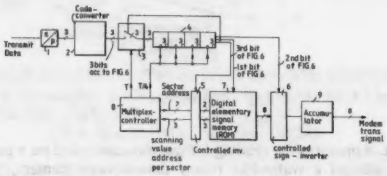
Heinz Göckler, Backnang, and Hagen Hofmeister, Korb, both of Fed. Rep. of Germany, assignors to Licentia-Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 2, 1980, Ser. No. 136,733

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1979, 2913669

Int. Cl.³ H03K *7/10;* **H04L** *5/12*

U.S. Cl. 375—67 **9 Claims**



1. In a method for generating modem transmission signals with quadrature amplitude modulation (QAM) wherein sample values of elementary bandpass signals are stored in digitally coded form, and including weighting the elementary bandpass signals with coefficients depending on the information to be transmitted and forming the modem transmission signals by superposition of the thus weighted elementary bandpass signals, the improvement, in the case of n-PSK modulation wherein n=4, 8, 12, 16 . . . , comprising the steps of: selecting the phase positions of the elementary bandpass signals such that the two dimensional four quadrant phase diagram is symmetrical to the axis $\phi=0$, and no elementary bandpass signal coincides with the axis $\phi=0$; storing $\frac{1}{4}n$ elementary bandpass signals, which cannot be derived from any other bandpass signal of said phase diagram neither due to symmetry with the axis $\phi=0$, or the axis $\phi=90°$, respectively, nor by symmetry to the origin of said phase diagram, in a digital memory; and obtaining the remaining elementary bandpass signals by one of the following:

(a) reading one of the stored signals out of the digital memory in a forward direction and weighting same with a -1 coefficient,

(b) reading one of the stored signals out of the digital memory in a backward direction and weighting same with a $+1$ coefficient, and

(c) reading one of the stored signals out of the digital memory in a backward direction and weighting same with a -1 coefficient.

4,327,440

SIGNAL DETECTOR FOR USE IN DIGITAL COMMUNICATION

Yukitsuna Furuya, and Fumio Akashi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1980, Ser. No. 132,482

Int. Cl.³ H03K *13/34;* **H04L** *27/06*

U.S. Cl. 375—76 **48 Claims**

1. A signal detector for use in digital signal communication, comprising:

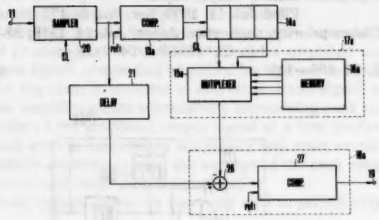
a tentative decision means for assigning certain symbols to receiving signals based on a predetermined value;

a first memory means for storing the output of said tentative decision means in sequence;

a second memory means for storing a plurality of reference values prepared in association with all the signal patterns

to be received, said signal patterns corresponding to the symbol sequence assigned by said first memory means, at least some of said reference values comprising a distortion correction quantity;

a selection means for selecting at least one said reference values based on at least a part of the contents of said first memory; and



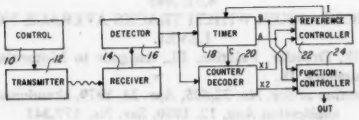
a processing means wherein there is produced by using said selected reference value the process to relate said receiving signals with signals to be received that are the most likely receiving signals among all the signals to be received, thereby producing an output, said processing means including means using said distortion quantity for correcting the distortion of said receiving signals and means for assigning output signals based on a predetermined value.

4,327,441

METHOD AND APPARATUS FOR SYNCHRONIZING AND CALIBRATING A RECEIVER TO A PULSE WIDTH MODULATION TRANSMITTER

David H. Bradshaw, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 31, 1980, Ser. No. 136,030
Int. Cl.[3] H04L 7/10
U.S. Cl. 375—113 12 Claims



1. A communication system comprising, in combination:

(A) transmitter means for transmitting a pulse width modulated control signal having a synchronizing pulse, a reference pulse, and at least one control function pulse encoded therein; and

(B) receiver means for receiving said transmitted control signal, detecting said pulses encoded therein, and for performing a control function determined by the width of said control function pulse relative to the width of said reference pulse, said receiver means comprising:

(a) receiver means for receiving the transmitted control signal;

(b) detection means for detecting said synchronizing, reference and control function pulses in said received control signal:

(c) timing means for providing, in response to each said detected pulse, a timing pulse having a width related to a reference signal;

(d) reference controller means for comparing the width of the said detected reference pulse to the width of the said timing pulse, and for providing the said reference signal at a level automatically selected to calibrate the width of said timing pulse to the width of said detected reference pulse; and

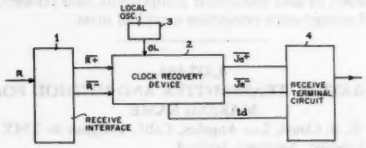
(e) function controller means for comparing the width of the said detected control function pulse to the width of the said calibrated timing pulse, and for performing the said control function in response to a predetermined compared width difference.

4,327,442

CLOCK RECOVERY DEVICE

Claude Athenes; Jacques E. Salle, and Philippe Blouin, all of Colombes, France, assignors to Le Materiel Telephonique Thomson-CSF, Colombes, France

Filed Mar. 20, 1980, Ser. No. 139,104
Claims priority, application France, Mar. 26, 1979, 79 07536
Int. Cl.[3] H03B 3/06
U.S. Cl. 375—119 4 Claims

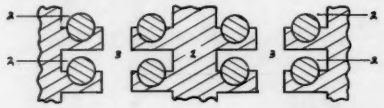


1. A device for recovering the distant clock signal from one or more incident digital signals, comprising first means for generating a clock frequency having the same nominal frequency f as the distant clock signal from local oscillator means for producing a having a nominal frequency F, equal to nf, and said first means having a resetting input, second means including means for detecting the leading edges of the pulses of the received signal or signals and means for generating a synchronization pulse following each detection of a pulse leading edge, characterized by the fact that the second means has a resetting input and further includes means for regenerating the received signal or signals in the form of a signal or signals whose pulses are calibrated in width, and synchronous with, the local oscillator, first and second shift circuits, the output of said synchronization pulse generation means being connected to the input of said first shift circuit whose output is connected to said resetting input of the first means and also to the input of said second shift circuit which is selected as a function of the desired width of the regenerated pulses, and whose output is connected to said resetting input of the second means, and by the fact that the device further includes third means for retiming the regenerated pulses, said third means including a first shift circuit whose input is connected to the output of the first means and whose output produces the recovered distant clock, and a second shift circuit which includes for each received signal a shift system, the shift being the same for all the systems of the second shift circuit, whose input is connected to the output of the means regenerating the received signal and whose output produces a delayed signal, the number of shifts being selected such that the recovered clock signal retimes the pulses of the delayed signals obtained from the second circuit as late as possible, i.e. one local oscillator period before the end of each pulse in order to allow maximum possible jitter compensation.

4,327,443
CAPILLARY LIQUID FUEL NUCLEAR REACTOR

Donald J. Cotton, 1101 3rd Street, S.W., Washington, D.C. 20024

Continuation-in-part of Ser. No. 912,731, Jun. 5, 1978, abandoned. This application Jan. 17, 1980, Ser. No. 112,739
Int. Cl.³ G21C 3/44
U.S. Cl. 376—359 4 Claims

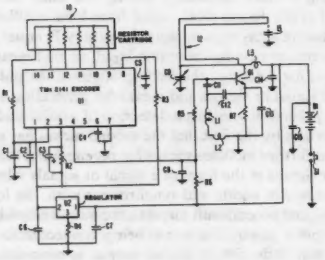


1. A nuclear reactor core comprised of a number of moderator components and fuel components wherein said fuel component is comprised of capillary fuel elements created by the method of confining a liquid fuel in a horizontal capillary trough to which said liquid fuel is nonadhesive so that a meniscus of said liquid fuel projects above said capillary trough edge, and said capillary fuel elements are arranged in a geometric and spatial pattern with support to form said fuel components; said fuel components are arranged in a geometric and spatial pattern in relationship to said moderator components with sufficient separation maintained between said components to create channels for a coolant to circulate therein; and the combination of said moderator components, said coolant, and said fuel components comprises a critical mass.

4,327,444
MINIATURE TRANSMITTER AND METHOD FOR MAKING SAME

Patrick R. J. Court, Los Angeles, Calif., assignor to TMX Systems Limited, Northern Ireland

Filed Jun. 4, 1979, Ser. No. 45,129
Int. Cl.³ H04B 1/034
U.S. Cl. 455—100 40 Claims

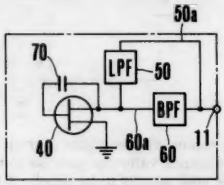


1. A miniature hand-held radio-frequency transmitter comprising a housing; a fixed-frequency transmitter circuit mounted within said housing; battery means within said housing for powering said transmitter circuit; and switch means on the exterior of said housing, when operated, for controlling said transmitter circuit to generate a predetermined frequency; characterized by said transmitter circuit having a detuned antenna which is fed a signal which is integrally related, but not equal, to said predetermined frequency and which is tuned to a frequency which is slightly different from said signal such that the power radiated by the detuned antenna is at a level lower than the maximum power which would otherwise be radiated thereby, the clasping of said housing by a hand shifting the center frequency of the antenna characteristic toward the frequency of said signal such that absorption of radiated power by an enveloping hand is automatically compensated by hand-capacitance effects which shift the center frequency of the antenna characteristic toward the frequency of said signal so that the radiated power is approximately the same and equal to said lower level whether the transmitter operates in free space or is clasped by a hand.

4,327,445
FREQUENCY CONVERTER

Masafumi Tanaka, Koganei, Japan, assignor to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1979, Ser. No. 56,472
Claims priority, application Japan, Jul. 14, 1978, 53-85087
Int. Cl.³ H04B 1/04, 1/28
U.S. Cl. 455—118 4 Claims

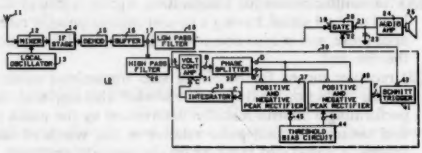


2. In a frequency converter comprising a frequency converting circuit including a self-excited type oscillator; input filter means coupled to said frequency converting circuit for frequency filtering signals input thereto over a first frequency range, said input filter means including a low pass filter for passing an intermediate frequency; output filter means coupled to said frequency converting circuit for frequency filtering signals supplied by said frequency converting circuit over a second frequency range, said output filter means including a band pass filter for passing the signal output of the oscillator, said first frequency range being different from said second frequency range; and a single terminal coupled to the input of said input filter means for supplying input signals thereto and coupled to the output of said output filter means for supplying output signals therefrom.

4,327,446
NOISE BLANKER WHICH TRACKS AVERAGE NOISE LEVEL

Roger W. Dressler, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 32,625, Apr. 23, 1979, abandoned. This application Aug. 12, 1980, Ser. No. 177,341
Int. Cl.³ H04B 1/10
U.S. Cl. 455—223 12 Claims



1. A noise blanker circuit for eliminating inpulse noise in a received information signal, comprising:

terminal means for receiving an input signal comprising an information signal which is accompanied by background noise and noise impulses;

noise detection means coupled to said terminal means for receiving said input signal and producing a noise detect signal related to said background noise and noise impulses but substantially independent of said information signal, said noise detect signal having peak magnitudes;

blanking pulse generating means coupled to said noise detection means for receiving said noise detect signal and producing noise blanking pulses in response thereto; and

controllable gate means coupled to said blanking pulse generating means and said terminal means for receiving said input signal and said noise blanking pulses and selectively passing and blocking said input signal in response to said noise blanking pulse;

wherein the improvement comprises said blanking pulse generating means including in combination;

noise amplifier means for receiving said noise detect signal and producing at an output terminal an amplified noise output signal, comprising amplified background noise and noise impulses, in response to said noise detect signal, said noise amplifier means substantially maintaining peak magnitudes of the amplified output signal at a first predetermined level by controlling the gain of said noise amplifier means in accordance with the average of the peak magnitudes of said noise detect signal; and

threshold switch means for receiving said amplified output signal and producing said blanking pulses in response to said amplified output signal exceeding a second predetermined level greater in absolute magnitude than said first predetermined level;

wherein said noise amplifier means includes circuitry including rectifier means and integrator means for controlling said noise amplifier gain by producing a DC control signal which is determined by the average of the peak magnitudes of said noise detect signal and wherein said DC control signal determines the gain of said noise amplifier means, wherein occasional large magnitude noise impulses in said noise detect signal which do not substantially change the average peak magnitude of said noise detect signal will result in blanking pulses since the gain of the noise amplifier means and said control signal will not be substantially changed in response to these large magnitude noise impulses.

DESIGN PATENTS

GRANTED APR. 27, 1982

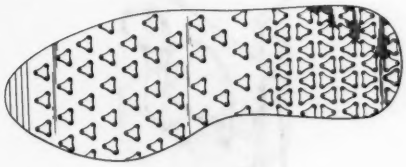
ERRATA

For CLASS	See PATENT NO.
D32–037	264,040
D34–038	264,066
D34–038	264,067
D32–023	264,087

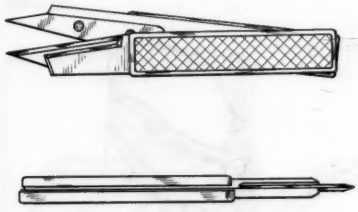
264,015
CHOCOLATE CHRISTMAS TREE
Luigi Criveller, 64 Windward Dr., Apt. 604, St. Catharines, Ontario, Canada
Filed Nov. 30, 1979, Ser. No. 99,156
Claims priority, application Canada, Jun. 19, 1979, 19-06-79-1
Term of patent 14 years
Int. Cl. D01—*01*
U.S. Cl. D1—19

264,016
HEAD MOUNTED FAN
Mark E. Fournier, 3808 E. Dahlia, Phoenix, Ariz. 85032
Filed Feb. 7, 1980, Ser. No. 119,524
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—253

264,017
CLEATED SHOE SOLE
Jerome Turner, 7 Greenheather Ct., Pikesville, Md. 21208
Filed Jan. 29, 1979, Ser. No. 7,107
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

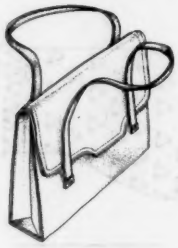


264,018
THREAD SNIPS
Clair H. Gingher, Jr., Greensboro, N.C., assignor to Gingher, Inc., Greensboro, N.C.
Filed Dec. 17, 1979, Ser. No. 104,295
Term of patent 14 years
Int. Cl. D08—*03*
U.S. Cl. D3—18



264,019
HANDBAG
Otto K. Schimmel, Scottsdale, Ariz., assignor to AMBA Marketing Systems, Inc., Tempe, Ariz.
Filed Jul. 14, 1980, Ser. No. 168,579
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—52

264,020
HANDBAG
Otto K. Schimmel, Scottsdale, Ariz., assignor to AMBA Marketing Systems, Inc., Tempe, Ariz.
Filed Jul. 14, 1980, Ser. No. 168,580
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—52



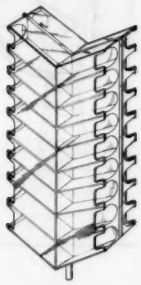
264,021
HANDBAG
Otto K. Schimmel, Scottsdale, Ariz., assignor to AMBA Marketing Systems, Inc., Tempe, Ariz.
Filed Jul. 14, 1980, Ser. No. 168,578
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—53

264,022
PHOTOGRAPH CARRIER
Philip B. Wayman, 1057 California Ave., Salt Lake City, Utah 84104
Filed Apr. 18, 1979, Ser. No. 31,234
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—60

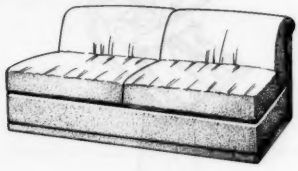
264,023
LUGGAGE
Ted Stark, Jersey City, N.J., assignor to M & M Luggage Co., Inc., Jersey City, N.J.
Filed Jan. 12, 1981, Ser. No. 224,330
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

264,024
LUGGAGE
Ted Stark, Jersey City, N.J., assignor to M & M Luggage Co., Inc., Jersey City, N.J.
Filed Jan. 15, 1981, Ser. No. 225,415
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

264,025
EYEGLASS DISPLAY RACK
Robert P. Franklin, Lake Hopatcong, and John G. Dewees, Morristown, both of N.J., assignors to Trans-World Manufacturing Corp., Little Ferry, N.J.
Division of Ser. No. 19,779, Mar. 12, 1979, Pat. No. Des. 258,099. This application Mar. 4, 1980, Ser. No. 127,222
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24

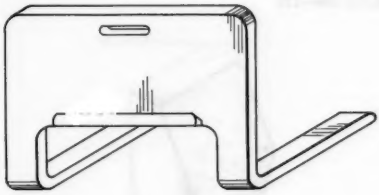


264,026
SOFA
John Mascheroni, 200 E. 64th St., New York, N.Y. 10021
Filed Aug. 29, 1979, Ser. No. 70,776
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—61

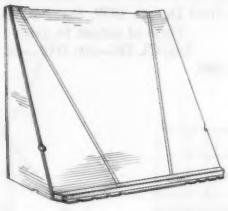


264,027
CHAIR
Robert J. Aronowitz, New York, and Bernard D. Katzanek, Brooklyn, both of N.Y., assignors to Robert Bernard Associates, Brooklyn, N.Y.
Filed Sep. 12, 1979, Ser. No. 74,612
The portion of the term of this patent subsequent to Nov. 24, 1998, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66

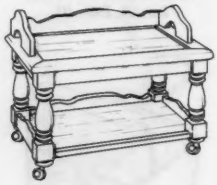
264,028
BOOK STAND
Dorothy H. Kellogg, 1711 G St. #7, Sacramento, Calif. 95814
Filed Jun. 25, 1979, Ser. No. 51,437
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—184



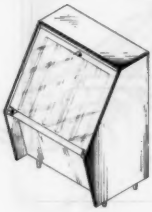
264,029
COLLAPSIBLE ARTICLE SUPPORT OR SIMILAR ARTICLE
Donald B. Smith, R.R. No. 1, Mount Brydges, Ontario, Canada (N0L 1W0)
Filed Jul. 12, 1979, Ser. No. 56,812
Claims priority, application Canada, Jun. 4, 1979, 04-06-79-6
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—184



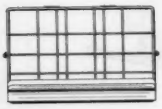
264,030
TABLE
Samuel T. Collins, Bassett, Va., assignor to Trend Line Furniture Corporation, Amsterdam, N.Y.
Filed Apr. 12, 1979, Ser. No. 29,245
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—153



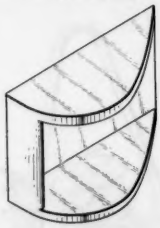
264,031
COMBINED FOOD PATTIE DISPLAY AND DISPENSER CABINET
Egon Sorensen, Cheyenne, Wyo., assignor to AMF Incorporated, White Plains, N.Y.
Filed Feb. 25, 1980, Ser. No. 124,367
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—173



264,032
COMBINED NEWSPAPER AND BOOK HOLDER
Robert J. Rule, 709 Forrest Ave., Kansas City, Mo. 64106
Filed Dec. 3, 1979, Ser. No. 99,327
Term of patent 14 years
Int. Cl. D6—*06;* D19—*02*
U.S. Cl. D6—180

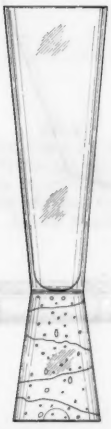


264,033
SHELVING UNIT
Frederick E. Markus, 20 Park Ave., Belmont, Mass. 02178
Filed Sep. 20, 1979, Ser. No. 77,296
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186

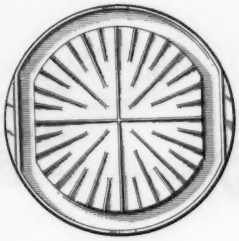


264,034
COMBINED DISPLAY AND DISPENSER FOR CANDY CONTAINERS OR THE LIKE
Amilcare Dogliotti, Alba, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Italy
Filed Feb. 20, 1980, Ser. No. 122,904
Claims priority, application United Kingdom, Aug. 31, 1979, 991376/79
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—189

264,035
GOBLET
Timo Sarpaneva, Helsinki, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland
Filed Nov. 9, 1979, Ser. No. 92,761
Claims priority, application Finland, May 18, 1979, 79334
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—13

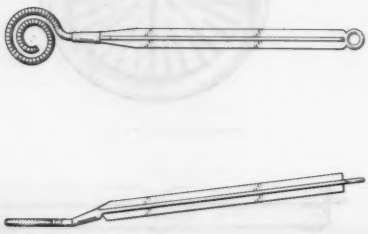


264,036
ROASTING RACK FOR FOOD
James F. Pomroy, St. Paul, Minn., and Albert E. Colato, Valencia, Calif., assignors to Plastics, Inc., St. Paul, Minn.
Filed Apr. 11, 1980, Ser. No. 139,239
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—94

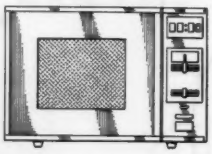


264,037
OVEN RACK MOVING TOOL
Ruth M. Johnson, 3537 W. 28th St., Minneapolis, Minn. 55416
Filed Dec. 5, 1979, Ser. No. 100,339
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—99

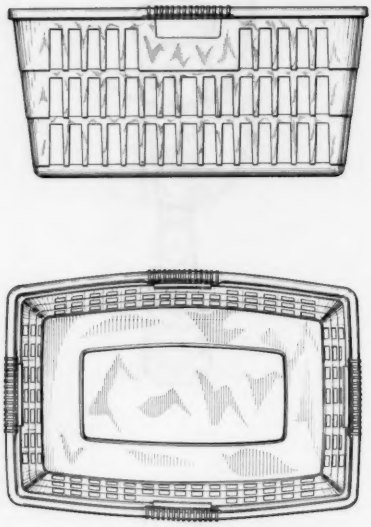
264,038
CANDY DIPPING TOOL
Ervan E. Guttman, Cincinnati, Ohio, assignor to The Ervan Guttman Company, Cincinnati, Ohio
Filed May 22, 1980, Ser. No. 152,506
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—103



264,039
MICROWAVE OVEN
Yoshio Suganoya, and Takao Miyake, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 25, 1979, Ser. No. 42,625
Claims priority, application Japan, Dec. 4, 1978, 53-51511
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128

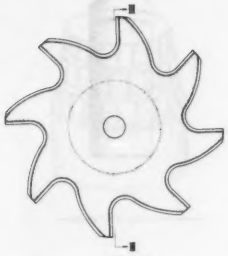


264,040
LAUNDRY BASKET
Walter A. Kunze, Coraopolis, Pa., assignor to Cities Service Company, Tulsa, Okla.
Filed Jul. 16, 1979, Ser. No. 57,876
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—37



264,041
HAND-HELD ROPE WICK APPLICATOR
Ricks H. Pluenneke, Rte. 7, Box 441E, Fort Worth, Tex. 76119
Filed Jun. 3, 1980, Ser. No. 156,086
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—02

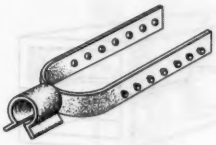
264,042
BLADE FOR POWER SCYTHE
Hisashi Inaga, Tokyo, and Masato Nogawa, Yokohama, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan
Filed Jun. 5, 1979, Ser. No. 45,748
Claims priority, application Japan, Mar. 13, 1979, 54-9885
Term of patent 14 years
Int. Cl. D8—*03*; D15—*03*
U.S. Cl. D8—20



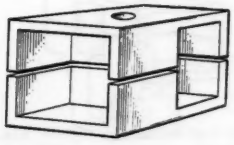
264,043
TIRE IMPLEMENT OR THE LIKE
Luther E. Edwards, 105 Oglesby Rd., Morehead City, N.C. 28557
Filed Feb. 25, 1980, Ser. No. 124,604
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—31

264,044
CAR DOOR UNLOCKING AND LOCKING DEVICE
Achille Lazazzera, 5721 Sheridan Rd., Youngstown, Ohio 44514
Filed Jan. 18, 1979, Ser. No. 4,568
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—88

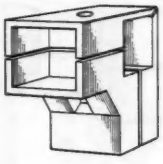
264,045
ADJUSTABLE ELECTRICAL CORD CLAMP
James M. Elliot, 3163 Coolidge Ave., Oakland, Calif. 94602; Eric A. Rickel, and Terri F. Rickel, both of 18018 Lazy Dog Rd., Nevada City, Calif. 95959
Filed Mar. 24, 1980, Ser. No. 133,357
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—355



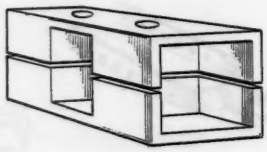
264,046
COUPLING
Bengt Magner, Mellösa, Sweden, assignor to Opto-System AB, Mellösa, Sweden
Filed Sep. 26, 1979, Ser. No. 79,104
Claims priority, application Sweden, Mar. 30, 1979, 79-0820
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382



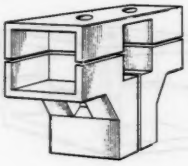
264,047
COUPLING
Bengt Magner, Mellösa, Sweden, assignor to Opto-System AB, Mellösa, Sweden
Filed Sep. 27, 1979, Ser. No. 79,447
Claims priority, application Sweden, Mar. 30, 1979, 79-0820
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382



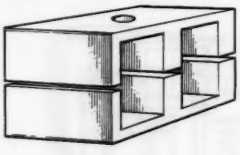
264,048
COUPLING OF AT LEAST TWO TUBES OR RODS CONNECTED THEREBY
Bengt Magner, Mellösa, Sweden, assignor to Opto-System AB, Mellösa, Sweden
Filed Sep. 27, 1979, Ser. No. 79,448
Claims priority, application Sweden, Mar. 30, 1979, 79-0820
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382



264,049
COUPLING OF AT LEAST TWO TUBES OR RODS CONNECTED THEREBY
Bengt Magner, Mellösa, Sweden, assignor to Opto-System AB, Mellösa, Sweden
Filed Sep. 27, 1979, Ser. No. 79,449
Claims priority, application Sweden, Mar. 30, 1979, 79-0820
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382

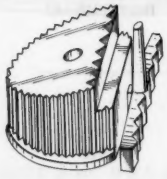


264,050
COUPLING OF AT LEAST TWO TUBES OR RODS CONNECTED THEREBY
Bengt Magner, Mellösa, Sweden, assignor to Opto-System AB, Mellösa, Sweden
Filed Sep. 27, 1979, Ser. No. 79,450
Claims priority, application Sweden, Mar. 30, 1979, 79-0820
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382



264,051
BOTTLE
Mirta R. Perales, 214 Andalusia Ave., Coral Gables, Fla. 33134
Filed Mar. 13, 1980, Ser. No. 130,025
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—404

264,052
COMBINED DISPENSER CAP AND SEPARABLE CLOSURE PLUG THEREFOR
Alan H. Bailey, Middlesbrough, England, assignor to USM Corporation, Farmington, Conn.
Filed Dec. 1, 1978, Ser. No. 965,728
Claims priority, application United Kingdom, Jun. 6, 1978, 984943/78
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—449

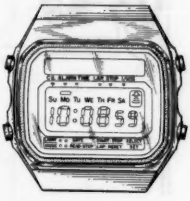


264,053
DISPENSER SPOUT FOR A SQUEEZE-TYPE CONTAINER
Han S. Ma, 1450 Cooper Rd., Hoffman Estates, Ill. 60195, and Michael Melnik, 950 Washington Blvd., Oak Park, Ill. 60302
Filed Dec. 19, 1979, Ser. No. 105,198
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—442

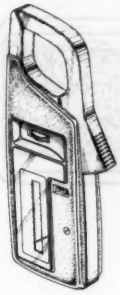
264,054
SPRAY CAN CAP
Lothar Kieber, Mülheim an der Ruhr, Fed. Rep. of Germany, assignor to Deutsche Calypsolgesellschaft mbH & Co., Dusseldorf, Fed. Rep. of Germany
Filed Feb. 1, 1980, Ser. No. 117,594
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1979, MR 4956
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—453

264,055
WATCH
Susumu Suzuki, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Apr. 23, 1980, Ser. No. 142,947
Claims priority, application Japan, Oct. 26, 1979, 54-45134
Term of patent 3½ years
Int. Cl. D10—*02*
U.S. Cl. D10—38

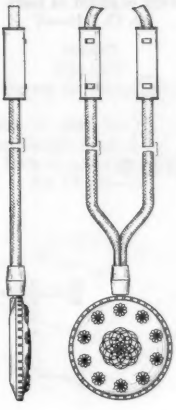
264,056
WATCH
Susumu Suzuki, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Apr. 23, 1980, Ser. No. 142,948
Claims priority, application Japan, Oct. 26, 1979, 54-45133
Term of patent 3½ years
Int. Cl. D10—*02*
U.S. Cl. D10—38



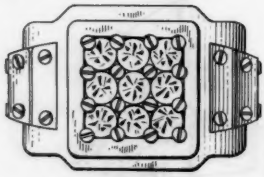
264,057
VOLT-OHM-AMMETER OR THE LIKE
Takeo Kuramoto, Tokyo, Japan, assignor to Kyoritsu Electrical Instruments Works, Ltd., Tokyo, Japan
Filed Sep. 10, 1979, Ser. No. 73,958
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—79

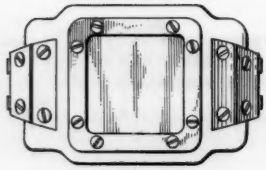


264,058
NECKLACE WITH ILLUMINABLE PENDANT
Miroslav Gordan, 2958 S. Laramie Ave., Cicero, Ill. 60650
Filed Jan. 3, 1980, Ser. No. 109,323
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—7

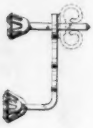


264,059
FINGER RING OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed May 28, 1980, Ser. No. 153,935
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—34





264,060
EARRING
Elias Epstein, Flushing, N.Y., assignor to Kaspar & Esh, Inc., New York, N.Y.
Filed Jan. 4, 1980, Ser. No. 109,463
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—40

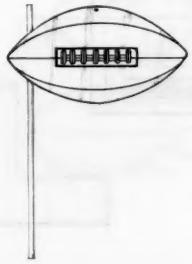


264,061
FIGURINE OF A SEAL PUP
Jesus A. C. Santa Eulalia, and Javier B. C. Santa Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Dec. 17, 1979, Ser. No. 104,695
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

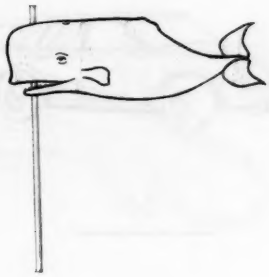
264,062
PENNANT
Larry B. Ornatek, 100 - 14th St., North Chicago, Ill. 60064
Filed Mar. 13, 1980, Ser. No. 115,895
Term of patent 3½ years
Int. Cl. D11—*05*
U.S. Cl. D11—166

264,063
PENNANT
Larry B. Ornatek, 100 - 14th St., North Chicago, Ill. 60064
Filed Mar. 13, 1980, Ser. No. 115,896
Term of patent 3½ years
Int. Cl. D11—*05*
U.S. Cl. D11—166

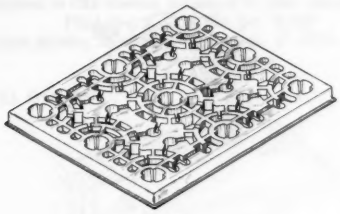
264,064
PENNANT
Larry B. Ornatek, 100 - 14th St., North Chicago, Ill. 60064
Filed Mar. 13, 1980, Ser. No. 116,018
Term of patent 3½ years
Int. Cl. D11—*05*
U.S. Cl. D11—166



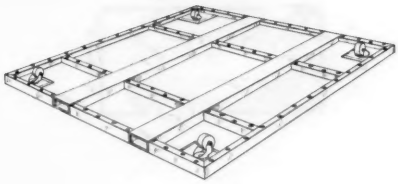
264,065
PENNANT
Larry B. Ornatek, 100-14th St., North Chicago, Ill. 60064
Filed Mar. 13, 1980, Ser. No. 116,047
Term of patent 3½ years
Int. Cl. D11—*05*
U.S. Cl. D11—166



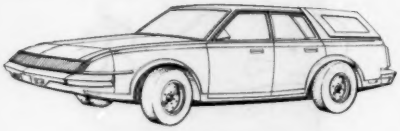
264,066
PALLET
Cecil H. Smith, and Bijan Mohraz, both of Dallas, Tex., assignors to Imperial Plastics Corporation, Dallas, Tex.
Filed Jan. 10, 1980, Ser. No. 110,913
Term of patent 14 years
Int. Cl. D9—*08*
U.S. Cl. D34—38



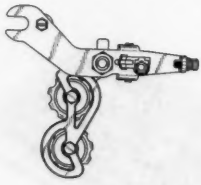
264,067
PALLET
Claes Nordström, Sigvard Grubbesgaten 12, S-230 40 Bara, Sweden
Filed Jan. 15, 1980, Ser. No. 112,180
Claims priority, application Sweden, Jul. 19, 1979, 79-1682
Term of patent 14 years
Int. Cl. D9—*08*
U.S. Cl. D34—38



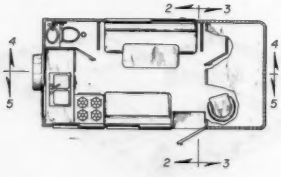
264,068
AUTOMOBILE
Henry D. Lauve, Troy, Mich., assignor to Electric Fuel Propulsion Corp., Troy, Mich.
Filed Oct. 23, 1979, Ser. No. 87,623
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91



264,069
BICYCLE REAR DERAILLEUR
Nobuo Ozaki, Osaka, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan
Filed Apr. 17, 1979, Ser. No. 30,740
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—124

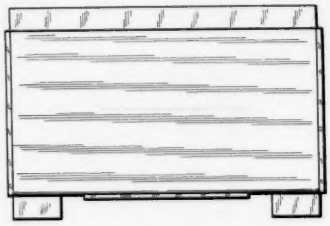


264,070
CAMPER INTERIOR
David E. Rowe, 2890 W. 62nd Ave., Denver, Colo. 80221
Filed Jan. 29, 1979, Ser. No. 7,416
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—195

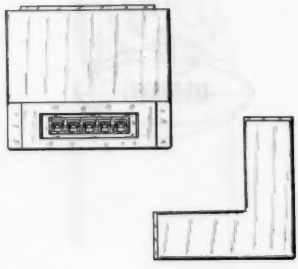


264,071
INSULATOR FOR BATTERY CONNECTORS
Ian D. MacKnight-Thomson, Plumsteadville, Pa., assignor to Arbonite Corporation, Doylestown, Pa.
Filed Oct. 4, 1979, Ser. No. 81,878
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—17

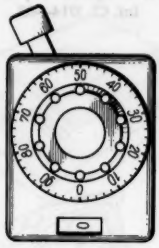
264,072
ELECTRICAL CONNECTOR
Nils G. Jonsson, Dunwoody, Ga., assignor to National Service Industries, Inc., Atlanta, Ga.
Filed Jan. 18, 1980, Ser. No. 113,225
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



264,073
ELECTRICAL CONNECTOR
Nils G. Jonsson, Dunwoody, Ga., assignor to National Service Industries, Inc., Atlanta, Ga.
Filed Jan. 18, 1980, Ser. No. 113,395
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

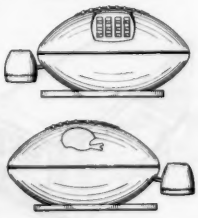


264,074
DIAL FOR USE WITH ELECTRONIC INSTRUMENTS
Eitaro Shimoda, 322, Ichinotsubo, Nakahara-ku, Kawasaki-shi, Kanagawa-ken, Japan
Filed Aug. 24, 1977, Ser. No. 827,385
Claims priority, application Japan, Mar. 22, 1977, 52-10345
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32

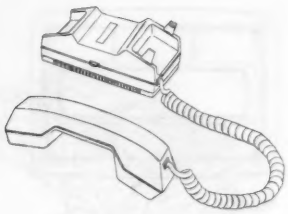


264,075
LOUD SPEAKER ENCLOSURE
Michael Levy, 160-15 Powels Cove Blvd., Beechhurst, N.Y. 11357
Filed Dec. 5, 1979, Ser. No. 100,647
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33

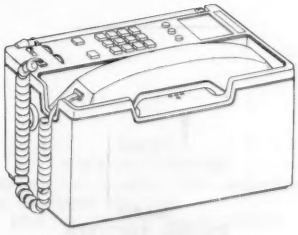
264,076
TELEPHONE
Steve D. Adams, Jr., 473 79th St., S., St. Petersburg, Fla. 33707
Filed Sep. 5, 1979, Ser. No. 72,664
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

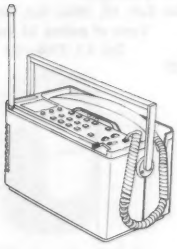


264,077
TELEPHONE SET
Hisao Fukushima, and Junji Hirooka, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Sep. 24, 1979, Ser. No. 78,175
Claims priority, application Japan, Apr. 13, 1979, 54-014625
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

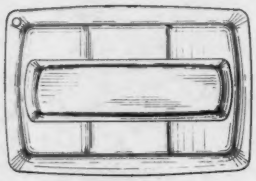


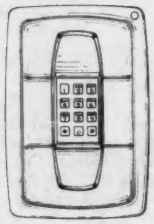
264,078
PORTABLE WIRELESS TELEPHONE SET
Hisao Fukushima, and Junji Hirooka, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Oct. 5, 1979, Ser. No. 82,147
Claims priority, application Japan, Apr. 12, 1979, 54-014472
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



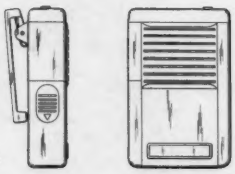


264,079
ELECTRONIC TELEPHONE UNIT
Fred Peterson, 1219 Tische Rd., Jefferson, Ohio 44047
Filed Oct. 26, 1979, Ser. No. 88,580
Term of patent 3½ years
Int. Cl. D14—*03*
U.S. Cl. D14—53

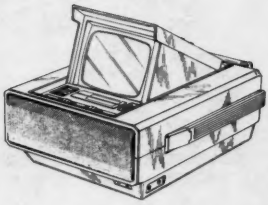




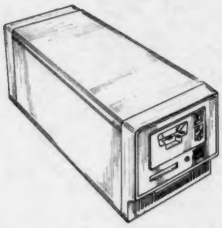
264,080
PAGING RECEIVER
Keisuke Iwata, Mansei Bldg., 1-16, 1-Chome, Soto-Kanda, Chiyoda-Ku, Tokyo, Japan
Filed Feb. 15, 1980, Ser. No. 121,665
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70



264,081
COMBINED RADIO AND TELEVISION RECEIVER
Isao Sekita, Kyoto; Kiyoshi Suzuki, Ibaraki; Kazuyoshi Sugisaki, Kyoto; Kenichi Ito, Kawanishi; Masaki Yamamoto, Kyoto, and Kazunori Mano, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed May 29, 1980, Ser. No. 154,566
Claims priority, application Japan, Dec. 3, 1979, 54-50714[U]
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70



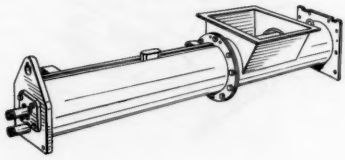
264,082
MEDIA CONVERTER UNIT FOR A MAGNETIC CARD FOR DATA PROCESSING DISPLAY SYSTEM
Claude H. Hutcheson, Garland, Tex., assignor to Xerox Corporation, Stamford, Conn.
Filed Oct. 10, 1979, Ser. No. 83,433
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—107



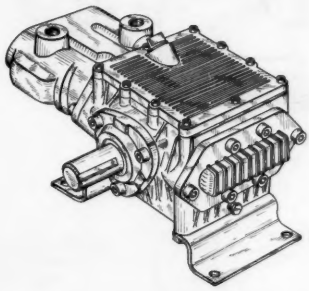
264,083
PRINTER HOUSING
Bernard A. Grae, Fort Worth, Tex., assignor to Tandy Corporation, Fort Worth, Tex.
Filed Nov. 1, 1979, Ser. No. 90,452
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—111

264,084
TROLLING MOTOR TILLER
Randall E. Morgan, 604 Wilson, Tahlequah, Okla. 74464
Filed Mar. 12, 1979, Ser. No. 19,490
Term of patent 14 years
Int. Cl. 15—*01*
U.S. Cl. D15—4

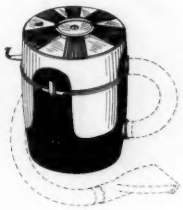
264,085
PUMP FOR A MANURE HANDLING SYSTEM OR THE LIKE
Tymen Clay, 904 Downie St., Box 788, Stratford, Ontario, Canada (N5A 6W1)
Filed Sep. 4, 1979, Ser. No. 72,406
Claims priority, application Canada, Jul. 26, 1979, 260779
Term of patent 7 years
Int. Cl. D15—*02*
U.S. Cl. D15—7



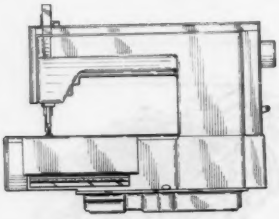
264,086
TRIPLEX PISTON PUMP
Ramon Pareja, Edina, Minn., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Dec. 26, 1979, Ser. No. 106,449
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7

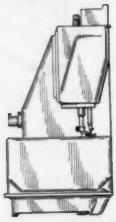


264,087
VACUUM CLEANER
Lester H. Bennett, Los Alamitos, Calif., assignor to Bon-Aire Industries, Inc., Signal Hill, Calif.
Filed Nov. 13, 1980, Ser. No. 206,470
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—23

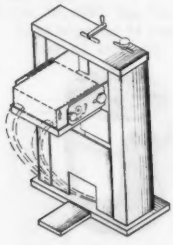


264,088
SEWING MACHINE
James H. Sullivan, Lincolnshire, and James C. Hsiao, Morton Grove, both of Ill., assignors to Union Special Corporation, Chicago, Ill.
Filed Dec. 17, 1979, Ser. No. 103,872
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—69

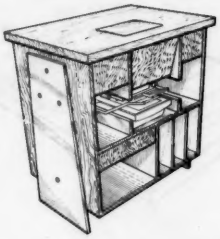




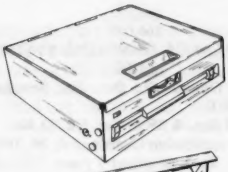
264,089
POSITIONER
Steven J. Reid, 4994 Capistrano Ave., San Jose, Calif. 95129, and Jack A. Ashman, 587 Woodstock Way, Santa Clara, Calif. 95050
Filed Mar. 3, 1980, Ser. No. 126,370
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—199

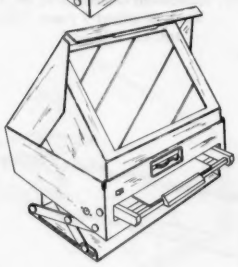


264,090
MICRO FICHE VIEWING CABINET
Gerald R. Walk, 2437 Russell Cir., Salt Lake City, Utah 84117
Filed Nov. 15, 1979, Ser. No. 94,582
Term of patent 3½ years
Int. Cl. D16—*03*
U.S. Cl. D16—11

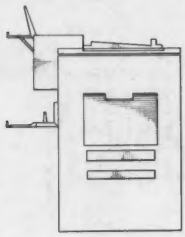


264,091
DESK DRAWER MICROFICHE READER
William T. Link, Berkeley, and Stephen Hobson, Palo Alto, both of Calif., assignors to Datagraphix, Inc., San Diego, Calif.
Filed Mar. 4, 1980, Ser. No. 127,264
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—18

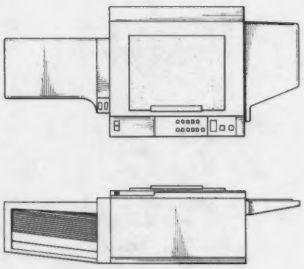




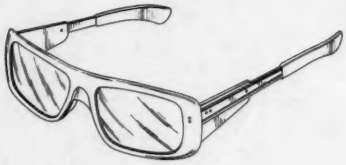
264,092
CONTINUOUS FORM FEEDING AND COPYING APPARATUS
R. Clark DuBois, Fairfield, and John C. Hamma, Milford, both of Conn., assignors to Gradco/Dendoki, Inc., Newport Beach, Calif.
Filed Jun. 25, 1980, Ser. No. 162,779
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—30



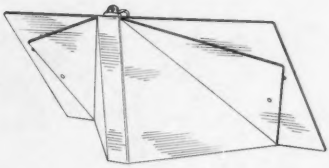
264,093
COPYING AND SORTING APPARATUS
Frederick J. Lawrence, Tustin, Calif., assignor to Gradco/Dendoki, Inc., Newport Beach, Calif.
Filed Jun. 12, 1980, Ser. No. 158,862
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



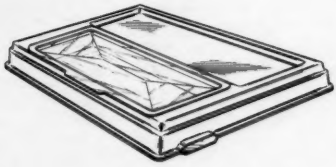
264,094
SUNGLASSES
John L. Morris, Springfield, Mo., assignor to Bass Pro Shops, Inc., Springfield, Mo.
Filed Mar. 6, 1980, Ser. No. 127,908
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—102



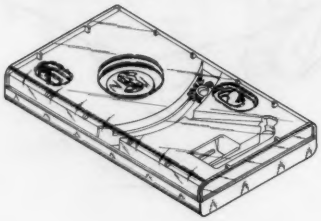
264,095
COMBINED ARTICLE SUPPORT AND BINDER
Donald B. Smith, R.R. No. 1, Mount Brydges, Ontario, Canada N0L 1W0
Filed Jul. 5, 1979, Ser. No. 54,830
Claims priority, application Canada, Jun. 4, 1979, 0406795
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—27



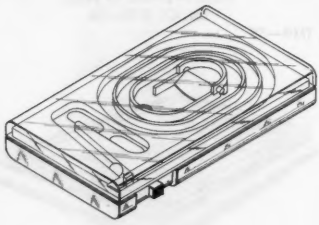
264,096
ART PALETTE
Jane E. Jones, 2805 S. Surrey Dr., Carrollton, Tex. 75006
Filed Feb. 2, 1979, Ser. No. 9,235
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—35



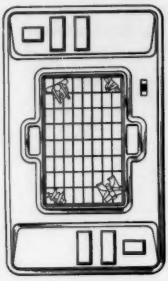
264,097
POCKET GAME
Masaki Mayuzumi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Sep. 7, 1979, Ser. No. 73,204
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—9



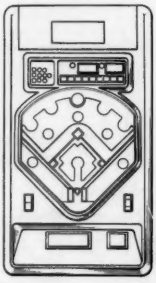
264,098
POCKET SIZE GAME BOX
Masaki Mayuzumi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jan. 29, 1980, Ser. No. 116,474
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—10



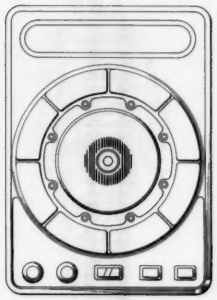
264,099
ELECTRONIC HAND-HELD SPACE BATTLE GAME HOUSING OR THE LIKE
Tsuneo Hanzawa, Tokyo, Japan, assignor to Entex Industries, Inc., Compton, Calif.
Filed Feb. 4, 1980, Ser. No. 118,061
Claims priority, application Japan, Dec. 17, 1979, 54-053037
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



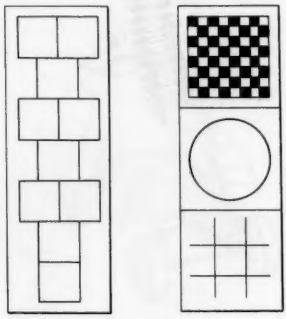
264,100
HAND-HELD ELECTRONIC BASEBALL GAME HOUSING OR THE LIKE
Tsuneo Hanzawa, Tokyo, Japan, assignor to Entex Industries, Inc., Compton, Calif.
Filed Mar. 13, 1980, Ser. No. 130,051
Claims priority, application Japan, Oct. 29, 1979, 54-45433
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



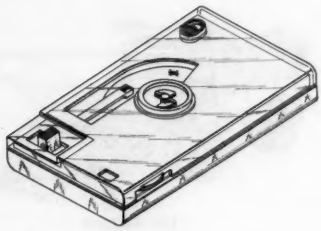
264,101
HAND-HELD ELECTRONIC GAME HOUSING OR THE LIKE
Tsuneo Hanzawa, Tokyo, Japan, assignor to Entex Industries, Inc., Compton, Calif.
Filed Mar. 14, 1980, Ser. No. 130,226
Claims priority, application Japan, Oct. 29, 1979, 54-45436
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



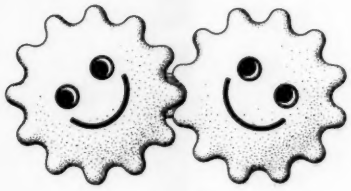
264,102
PLAY MAT
Jan Howard, 11270 Regal, Sterling Heights, Mich. 48078
Filed Jan. 18, 1979, Ser. No. 4,327
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—23



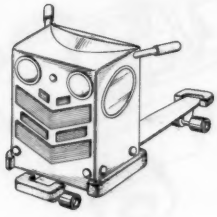
264,103
POCKET SIZE RACING GAME BOX
Masaaki Yoshimura, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jan. 29, 1980, Ser. No. 116,488
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—27



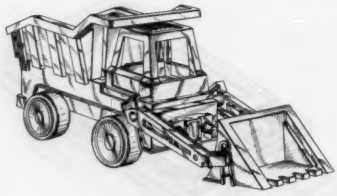
264,104
TOY RATTLE
Simon Gompes, Amsterdam, Netherlands, assignor to Europlastic B.V., Amsterdam, Netherlands
Filed Oct. 5, 1979, Ser. No. 82,008
Claims priority, application United Kingdom, Apr. 5, 1979, 989364/79
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—65



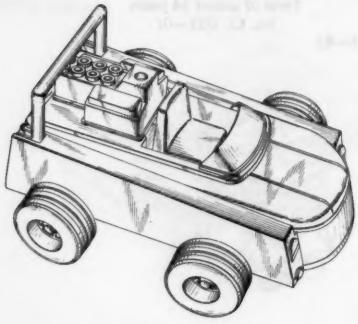
264,105
SKATEBOARD SCOOTER
Eugeno P. Dinnocente, 3836 Laurel Canyon, Studio City, Calif. 91604
Filed Sep. 21, 1979, Ser. No. 77,737
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—81



264,106
TOY TRUCK
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Filed Jul. 7, 1980, Ser. No. 165,861
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D21—132

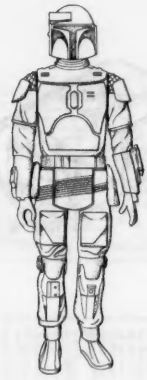


264,107
TOY CAR
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Filed Jul. 31, 1980, Ser. No. 174,033
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D21—137



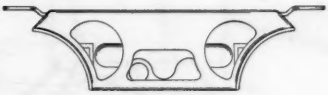
264,108
TOY RAILWAY TRACK SECTION
Duncan Tong, Hong Kong, Hong Kong, assignor to Playart Limited, Hong Kong, Hong Kong
Filed Mar. 29, 1979, Ser. No. 25,129
Claims priority, application United Kingdom, Nov. 29, 1978, 987466/78
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—143

264,109
TOY ACTION FIGURE
George W. Lucas, San Anselmo; Ralph McQuarrie, Los Angeles, and Joe Johnston, San Rafael, all of Calif., assignors to Lucasfilm, Ltd., North Hollywood, Calif.
Filed Aug. 13, 1979, Ser. No. 65,304
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150



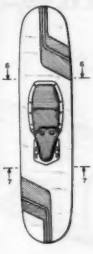
264,110
MONSTER WAGON
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Filed May 12, 1980, Ser. No. 148,711
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D21—174

264,111
ACCESSORY HOUSING FOR SKATE, SKATEBOARD, BICYCLE OR THE LIKE
Walter L. Jimison, 360 Fulton St., Palo Alto, Calif. 94301, and James W. Jimison, 466 S. 5th St., #3, San Jose, Calif. 95112
Filed Jul. 8, 1980, Ser. No. 166,935
Term of patent 14 years
Int. Cl. D21—*02*; D12—*11*
U.S. Cl. D21—226

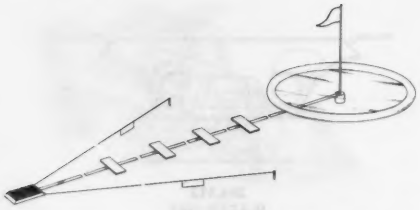


264,112
WATER SKI
Todd W. Roberts, Victoria, Minn. 55386
Filed Mar. 4, 1980, Ser. No. 127,102
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—229

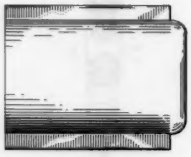
264,113
WATER SKI
Todd W. Roberts, Victoria, Minn. 55386
Filed Mar. 4, 1980, Ser. No. 127,103
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—229



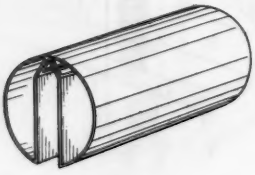
264,114
MINIATURE PRACTICE RANGE FOR PRACTICE TYPE GOLF BALLS
Christopher R. Wojciechowski, 3001 Antelo View Dr., Los Angeles, Calif. 90024
Filed Jun. 1, 1979, Ser. No. 44,560
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234



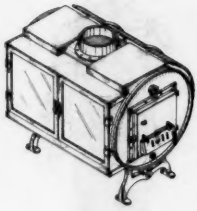
264,115
PRACTICE PUTTING CUP
William Murphy, DaCola Shores, Conesus, N.Y. 14435
Filed Oct. 24, 1979, Ser. No. 87,726
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234



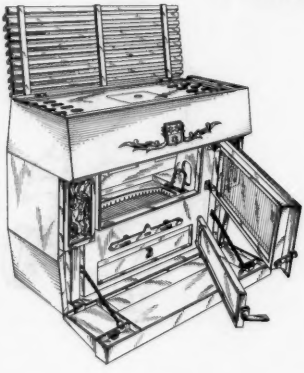
264,116
DRAIN PIPE
Gert Söderström, 62 Hammarbyvägen, S-19400 Upplands-Väsby, Sweden
Filed Jan. 15, 1980, Ser. No. 112,354
Claims priority, application Sweden, Jul. 16, 1979, 791672
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—45



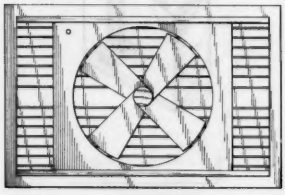
264,117
FREESTANDING FIREPLACE
Charles Jensen, 1914 Oakes Ave., Everett, Wash. 98201
Filed Feb. 8, 1980, Ser. No. 119,981
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

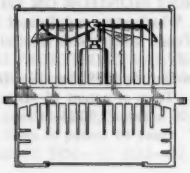


264,118
STOVE
Bernard Pringalle, Rue Orphee Variscotte, 59660 Merville, France
Filed Nov. 5, 1980, Ser. No. 204,301
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



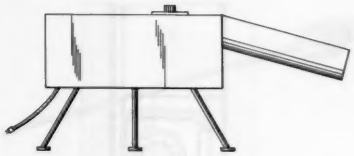
264,119
HEAT PUMP
Pavel Cech, Lerum, Sweden, assignor to Supercool AB, Goteborg, Sweden
Filed May 4, 1979, Ser. No. 35,808
Claims priority, application Sweden, Nov. 9, 1978, 2577
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—136



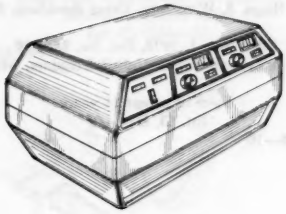


264,120
COVER FOR HEAT INSULATING MATERIAL AROUND ELBOW OR THE LIKE
Kazuo Karakawa, 12-12, Shizuka-cho, Koga-shi, Ibaragi-ken, Japan
Filed Oct. 17, 1978, Ser. No. 952,219
Claims priority, application Japan, Apr. 18, 1978, 53-15385
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—137

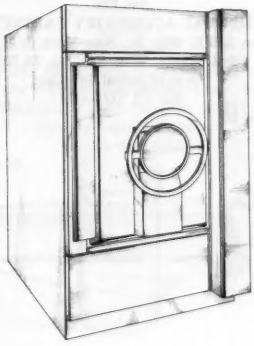
264,121
FIRE COMBUSTOR
Dennis K. Dewhurst, 1265 Palmetto Ave., Chico, Calif. 95926
Filed Aug. 9, 1979, Ser. No. 65,111
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D23—161



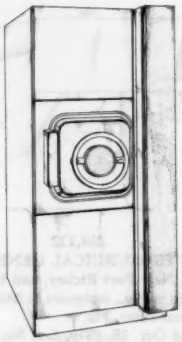
264,122
ELECTROSURGICAL GENERATOR
Roger L. Oosten, New Port Richey, and Bruce C. Randall, St. Petersburg, both of Fla., assignors to Medical Research Associates, Ltd., Clearwater, Fla.
Filed Oct. 25, 1979, Ser. No. 88,177
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—8



264,123
STERILIZER
Thomas Brendgord, and Joseph T. Sestak, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.
Filed Jan. 29, 1980, Ser. No. 116,531
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—9

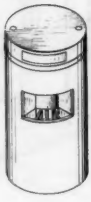


264,124
STERILIZER
Thomas Brendgord, and Joseph T. Sestak, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.
Filed Jan. 29, 1980, Ser. No. 116,532
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—9

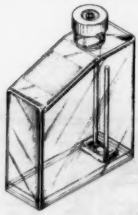


264,125
DENTAL PIN
Anthony J. Biggs, 9, Westdown, Great Bookham, Surrey, England
Filed Nov. 1, 1978, Ser. No. 956,799
Claims priority, application United Kingdom, May 3, 1978, 984424/78
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10

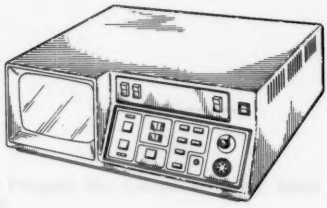
264,126
DENTAL ACCESSORY CABINET
Marvin Cutler, 220 E. 60th St., New York, N.Y. 10022
Filed May 3, 1979, Ser. No. 35,761
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10



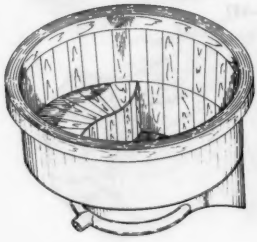
264,127
MEDICAL CULTURE BOTTLE
Dean M. Peterson, Escondido, Calif., assignor to Honeywell, Inc., Minneapolis, Minn.
Filed Jul. 9, 1979, Ser. No. 55,626
Term of patent 3½ years
Int. Cl. D14—*02*
U.S. Cl. D24—17



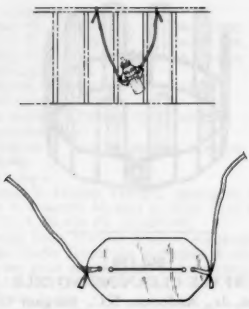
264,128
PATIENT MONITOR OR THE LIKE
Bruce J. Barnes, Winchester, and Robert H. Hendrix, Tullahoma, both of Tenn., assignors to Keuffel & Esser Company, Morristown, N.J.
Filed Dec. 5, 1979, Ser. No. 100,790
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17



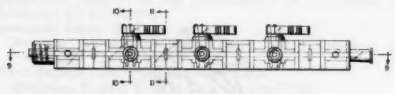
264,129
HYDROTHERAPY SPA
Victor J. Tulipani, Novato, Calif., assignor to Peregrine Industries, Incorporated, San Rafael, Calif.
Filed Apr. 2, 1979, Ser. No. 26,131
Term of patent 7 years
Int. Cl. D24—*02*; D23—*02*
U.S. Cl. D24—38

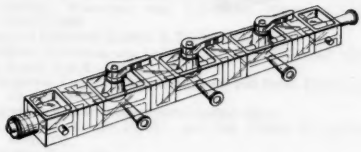


264,130
BABY BOTTLE HOLDER
David Rubin, 900 Whitmore, Detroit, Mich. 48203
Filed Oct. 23, 1978, Ser. No. 953,485
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—48



264,131
MEDICAL MULTIPORT VALVE COCK
Iwao Matsuura, Osaka, Japan, assignor to Nissho Corporation, Osaka, Japan
Filed Apr. 16, 1979, Ser. No. 30,639
Term of patent 14 years
Int. Cl. D24—*99*; D23—*01*
U.S. Cl. D24—53

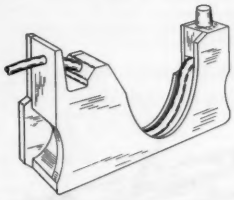




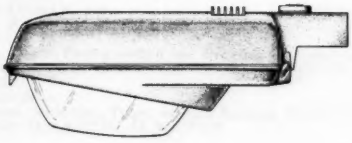
264,132
FLEXIBLE STYLET
Joseph N. Genese, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed May 3, 1979, Ser. No. 35,569
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—54

264,133
FLEXIBLE STYLET
Joseph N. Genese, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed May 3, 1979, Ser. No. 35,570
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—54

264,134
DISPOSABLE CASSETTE FOR USE IN A PERISTALTIC PUMP
Piritheos Xanthopoulos, San Jose, Calif., assignor to Stewart-Reiss Laboratories, Inc., Tarzana, Calif.
Filed May 7, 1979, Ser. No. 36,655
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—99



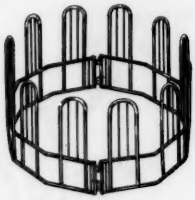
264,135
LUMINAIRE
Alexander Zwillich, and Dennis E. Bedel, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Oct. 2, 1979, Ser. No. 80,975
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D26—71



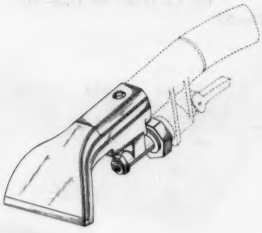
264,136
CEILING LAMP
Achille Castiglioni, Piazza Castello 27, Milano, Italy
Filed Apr. 2, 1979, Ser. No. 25,842
Term of patent 7 years
Int. Cl. D26—*05*
U.S. Cl. D26—85

264,137
CURLER
Harry Sundin, Karlshamn, Sweden, assignor to AB Karlshamns Plastindustri, Karlshamn, Sweden
Filed Oct. 12, 1978, Ser. No. 950,870
Claims priority, application Sweden, Apr. 20, 1978, 781105
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—37

264,138
HAY BALE FEEDER
Richard L. Harden, R.R. 1, Lineville, Iowa 50147
Filed Feb. 6, 1980, Ser. No. 119,180
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



264,139
SURFACE CLEANING NOZZLE
Fred E. Pearman, Jr., Anderson, S.C., assignor to The Singer Company, Stamford, Conn.
Filed May 2, 1980, Ser. No. 146,732
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—33



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF APRIL, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See*—
Cale, Albert D., Jr., 4,327,098, Cl. 424-250.000.
Cale, Albert D., Jr., 4,327,107, Cl. 424-273.00R.
Cale, Albert D., Jr., 4,327,108, Cl. 424-273.00R.

AB Bonnierforetagen: *See*—
Luning, Bjorn, 4,327,075, Cl. 424-12.000.

AB Svenska Flaktfabriken: *See*—
Svensson, Gunnar, 4,326,365, Cl. 52-204.000.

Abbott Laboratories: *See*—
D'Alo, Herbert F.; and Muetterties, Andrew J., 4,326,519, Cl. 128-214.400.

Abel, Kent W.: *See*—
Ryan, Lenore S.; Murray, Frank C.; Sprangers, Ann M.; Santoski, William J.; Sciaraffa, Michael A.; Abel, Kent W.; and Donnelly, Harold F., 4,326,528, Cl. 128-287.000.

Abeyama, Shozo; Saito, Makoto; Kimura, Atsuyoshi; and Nakamura, Sadayuki, to Daido Tokushuko Kabushiki Kaisha. Steel for cold forging having good machinability and the method of making the same. 4,326,886, Cl. 75-129.000.

Abramovitz, Irwin J.: *See*—
Berg, Norman J.; Casseday, Michael W.; Lee, John N.; and Abramovitz, Irwin J., 4,326,778, Cl. 350-358.000.

ACCO Industries Inc.: *See*—
Parry, James L.; Redden, Martin J.; and Goldstein, Albert, 4,326,466, Cl. 104-172.00S.

ACF Chemiefarma VA: *See*—
van Zorge, Jacob A., 4,327,213, Cl. 544-336.000.

ACF Industries, Incorporated: *See*—
Behle, Gunter R., 4,326,557, Cl. 137-316.000.

Acker, Otto H. Steam driven road vehicle. 4,326,598, Cl. 180-304.000.

Acker, Stanley. Combination lipstick display and storage container. 4,326,546, Cl. 132-79.00C.

Ackermann, Otto; Leuck, Hans; Meyer, Gunther; and Schmeling, Gerhard, to Dynamit Nobel AG. Method for the continuous preparation of alcoholates. 4,327,230, Cl. 568-851.000.

Adachi, Toshio; and Hiratake, Susumu, to Daidotokushuko Kabushikikaisha. Device for the pulverization of radioactive wastes. 4,326,842, Cl. 425-10.000.

Adamaszek, Dieter: *See*—
Strugala, Alfred; Schilling, Robert; and Adamaszek, Dieter, 4,326,397, Cl. 72-110.000.

Adcock-Ingram Laboratories Limited: *See*—
Armitage, Rodney E., 4,327,082, Cl. 424-92.000.

Adolphi, Heinrich: *See*—
Buerstinghaus, Rainer; Kiehs, Karl; Siegel, Hardo; and Adolphi, Heinrich, 4,327,090, Cl. 424-203.000.

Agence National de Valorisation de la Recherache (ANVAR): *See*—
Audibert, Francoise; and Lefrancier, Pierre, 4,327,085, Cl. 424-177.000.

Agency of Industrial Science & Technology: *See*—
Nakao, Yukimichi; and Fujishige, Shoei, 4,327,235, Cl. 585-270.000.

Agip Petroli, S.p.A.: *See*—
Imparato, Luigi; Gerbaz, Giampaolo; and Betta, Enrico, 4,327,237, Cl. 585-648.000.

Agrigenetics Research Associates Limited: *See*—
Lawrence, Robert H., Jr.; and Hill, Phillip E., 4,326,358, Cl. 47-58.000.

Ahnemiller, James: *See*—
West, Robert W.; Stott, Paul E.; and Ahnemiller, James, 4,327,196, Cl. 521-120.000.

Ainsworth, Leonard H.: *See*—
Heywood, Joseph R.; and Ainsworth, Leonard H., 4,326,351, Cl. 40-467.000.

Air O Scoop Corporation: *See*—
Chatlos, Richard, 4,326,451, Cl. 98-2.120.

Akashi, Fumio: *See*—
Furuya, Yukitsuna; and Akashi, Fumio, 4,327,440, Cl. 375-76.000.

Akhremenko, Fedor, deceased: *See*—
Injushin, Viktor M.; Khokhlov, Valentin I.; Akhremenko, Fedor, deceased; and Akhremenko, Galina T., administrator, 4,327,276, Cl. 219-121.00L.

Akhremenko, Galina T., administrator: *See*—
Injushin, Viktor M.; Khokhlov, Valentin I.; Akhremenko, Fedor, deceased; and Akhremenko, Galina T., administrator, 4,327,276, Cl. 219-121.00L.

Akimoto, Keiichi; and Tsuchida, Tsuyoshi, to Kawasaki Seitetsu Kabushiki Kaisha. Measuring instrument for the profile of piled charge of a blast furnace. 4,326,337, Cl. 33-174.0PA.

Akron City Hospital: *See*—
Steffel, Charles R.; and Taylor, Bruce C., 4,326,535, Cl. 128-631.000.

Aktiebolaget Bahco Ventilation: *See*—
Mattsson, Agne T., 4,326,913, Cl. 162-17.000.

Aktiebolaget Bofors: *See*—
Blomqvist, Ake; and Dahlberg, Kurt, 4,326,340, Cl. 33-238.000.

Aktieseiskabet de Danske Sukkerfabrikker: *See*—
Madsen, Rud F.; and Nielsen, Werner K., 4,326,892, Cl. 127-43.000.

Akutsu, Yoji: *See*—
Kita, Hisanao; Karatsu, Yoshinori; Nakazaki, Takamitsu; and Akutsu, Yoji, 4,327,273, Cl. 219-121.0EC.

Alfa Laval Pty Ltd.: *See*—
Brockwell, Ian P., 4,326,626, Cl. 198-845.000.

Allen-Bradley Company: *See*—
Grzebielski, Chester J., 4,327,391, Cl. 361-31.000.

Allen, James A.; Knight, George W.; and Edmondson, Morris S., to Dow Chemical Company, The. Anti-block additives for olefin polymers. 4,327,009, Cl. 524-114.000.

Alley, Ralph D. Brake-actuated catheter feeder. 4,326,520, Cl. 128-214.400.

Allied Chemical Corporation: *See*—
Lazarus, Stanley D., 4,327,207, Cl. 525-439.000.
Ray, Ranjan, 4,326,841, Cl. 425-8.000.
Vanderkooi, Nicholas, Jr.; and Tuller, Harold W., 4,327,007, Cl. 524-315.000.

Allis-Chalmers Corporation: *See*—
Hess, Paul D., 4,326,845, Cl. 432-106.000.

Alloy Surfaces Company, Inc.: *See*—
Baldi, Alfonso L., 4,327,134, Cl. 427-253.000.

Alpha Chemical Corporation: *See*—
West, Robert W.; Stott, Paul E.; and Ahnemiller, James, 4,327,196, Cl. 521-120.000.

Aluminum Company of America: *See*—
Anderson, Bruce E., 4,326,662, Cl. 228-111.000.

Alvarez, Jose A. A., to T & R Chemicals, Inc. Treatment of hypertension with bisulfite. 4,327,083, Cl. 424-162.000.

Alvino, William M.; Hammill, Janet L.; and Seidel, Martin P., to Westinghouse Electric Corp. Moisture resistant laminates impregnated with an impregnating composition comprising epoxy resin and a dicyandiamide derivative. 4,327,143, Cl. 428-236.000.

ALZA Corporation: *See*—
Swanson, David; and Edgren, David, 4,326,525, Cl. 128-260.000.

Amana Refrigeration, Inc.: *See*—
Austin, Buddy J.; and Simpson, James E., 4,327,266, Cl. 219-10.55F.

American Air Filter Company, Inc.: *See*—
Revell, Alan, 4,326,866, Cl. 55-479.000.

American Can Company: *See*—
Meyers, George L., 4,326,634, Cl. 206-626.000.

American Fabrics Company: *See*—
Gaiser, Gerhard O., 4,326,322, Cl. 28-187.000.

American Foam Latex Corporation: *See*—
Frankenberg, Carl R., 4,326,310, Cl. 5-448.000.

American Home Products Corporation: *See*—
Wei, Peter H. L., 4,327,221, Cl. 548-154.000.

American Optical Corporation: *See*—
Rybicki, Edward B.; and Sussman, Milton H., 4,326,779, Cl. 350-414.000.

American Standard Inc.: *See*—
Noble, Peter M., 4,326,693, Cl. 248-635.000.

Amicel, Jean-Claude. Blank jumping teleprinting method and apparatus. 4,327,381, Cl. 358-288.000.

AMP Incorporated: *See*—
Asick, John C.; and Huffnagle, Clifton W., 4,326,764, Cl. 339-14.00R.

Amrhein, Earl F., to Cummins Engine Company, Inc. Floating tappet guide plate. 4,326,484, Cl. 123-90.500.

Amtel, Inc.: *See*—
Tang, Phillip H., 4,326,312, Cl. 441-5.000.

An, Viktor B.: *See*—
Bukhtiyarov, Ivan D.; An, Viktor B.; Farshatov, Marat N.; Sapozhnikov, Fedor F.; Sidorov, Anatoly G.; Proskurina, Natalya A.; and Marakin, Vladimir I., 4,326,410, Cl. 73-117.300.

Anderson, Bruce E., to Aluminum Company of America. Process of ultrasonically soldering drawn aluminum tubing products. 4,326,662, Cl. 228-111.000.

Anderson, Conrad V.: *See*—
Beer, Robert E.; and Anderson, Conrad V., 4,326,791, Cl. 354-321.000.

Anderson, Max F. Drying method and apparatus for drying prunes, fish, brewers grain, shelled corn, and the like. 4,326,341, Cl. 34-27.000.

Ando, Akio: *See*—
Komatsu, Michiyasu; Tsuge, Akihiko; Komeya, Katsutoshi; and Ando, Akio, 4,327,187, Cl. 501-97.000.

Andra, Wolfhart: *See—*
Leonhardt, Fritz; Andra, Wolfhart; Zellner, Wilhelm; Schlaich, Jorg; and Mayr, Gunter, 4,326,363, Cl. 52-80.000.

Annand, Charles A. Rigid insulation assembly. 4,326,631, Cl. 206-389.000.

Antos, George J., to UOP Inc. Hydrocarbon isomerization catalyst and process. 4,327,240, Cl. 585-744.000.

Aoki, Hideki, to Dental Chemical Co., Ltd. Dentifrice compositions. 4,327,079, Cl. 424-57.000.

Aoki, Kanemasa, to Canon Kabushiki Kaisha; and Canon Seiki Kabushiki Kaisha. Winding for small rotary electric double air gap motor. 4,327,304, Cl. 310-266.000.

Aoki, Kozo; Seoka, Yoshio; and Yokota, Yukio, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 4,327,173, Cl. 430-505.000.

Aoyagi, Edward I., to Chevron Research Company. 2-Aminosubstituted-5-methylene-thiazole and 3-aminosubstituted-1 methylene-2,4-thiazaspiro[5.4]decane herbicides. 4,326,876, Cl. 71-090.000.

Aoyagi, Masao; and Kamata, Shigeru, to Canon Kabushiki Kaisha. Interchangeable lens assembly for a camera. 4,326,789, Cl. 354-286.000.

Aoyama, Takashi: *See—*
Kohara, Rikusei; Kakumoto, Susumu; Aoyama, Takashi; Shoji, Masami; and Shinagawa, Mutsuaki, 4,326,777, Cl. 350-357.000.

Apparatebau Gauting GmbH: *See—*
Thoma, Andreas, 4,327,286, Cl. 250-231.00R.

Appleford, David E.: *See—*
Faulkner, Keith; and Appleford, David E., 4,326,645, Cl. 222-1.000.

Arai, Kiyotaka: *See—*
Suhara, Manabu; and Arai, Kiyotaka, 4,327,010, Cl. 524-388.000.

Arai, Nobukatsu: *See—*
Sato, Eiji; Arai, Nobukatsu; Tanaka, Hideki; Fukushima, Toshihiko; and Nakajima, Tadakatsu, 4,326,391, Cl. 62-402.000.

Arai, Yoshio. Oil seal. 4,326,723, Cl. 277-153.000.

Arcamone, Federico: *See—*
Bernardi, Luigi; Masi, Paolo; Suarato, Antonino; and Arcamone, Federico, 4,327,029, Cl. 260-351.100.

Archer, Sydney, to Sterling Drug Inc. α-[(Alkylamine)alkyl]-4-hydroxy-3-(alkylthio)benzenemethanols, derivatives thereof and intermediates therefor. 4,327,224, Cl. 560-142.000.

Arend, Gunter; and Feyen, Peter, to Bayer Aktiengesellschaft. Preparation of phosphoric acid propargyl esters. 4,327,040, Cl. 260-973.000.

Arendt, Franz: *See—*
Wirz, Arno; Sobotta, Peter; Arendt, Franz; and Gramlich, Otto K., 4,327,135, Cl. 428-600.000.

Ariga, Masao: *See—*
Miyamoto, Koichi; Kan, Yasuhito; Nitanda, Hiroshi; and Ariga, Masao, 4,326,797, Cl. 355-57.000.

Arlt, Dieter: *See—*
Jautelat, Manfred; Arlt, Dieter; Lantzsch, Reinhard; Fuchs, Rainer; Riebel, Hans-Jochem; Schroder, Rolf; and Harnisch, Horst, 4,327,025, Cl. 260-338.000.

Armitage, Rodney E., to Adcock-Ingram Laboratories Limited. Mastitis vaccination. 4,327,082, Cl. 424-92.000.

Arnhem, Erik M.: *See—*
Rock, Gregory, 4,326,727, Cl. 280-154.50R.

Arp, David F.; and Pariani, Ronald L., to Southware Company. Dual fuel burner for metal melting furnaces. 4,326,700, Cl. 266-219.000.

Arpin, John B.; and Di Vita, Sam, to United States of America, Army. Optical fiber dispenser. 4,326,657, Cl. 226-97.000.

Asaba, Shuuji; Nemoto, Minoru; Ushimi, Kenji; and Ono, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Laser welding of an electron gun. 4,327,275, Cl. 219-121.0LD.

Asahi-Dow Limited: *See—*
Hoki, Tsuneo; and Matsuki, Yutaka, 4,327,193, Cl. 521-88.000.

Asahi Glass Company, Ltd.: *See—*
Endo, Yasuhiko; Mimori, Takashi; and Goto, Motohiro, 4,327,188, Cl. 501-134.000.
Kawahara, Hiroshi; and Yasuda, Tetsuro, 4,326,958, Cl. 210-500.200.
Suhara, Manabu; and Arai, Kiyotaka, 4,327,010, Cl. 524-388.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Katoh, Tsuneyuki; Hiraga, Keishiro; Seki, Junji; and Suzuki, Makoto, 4,327,149, Cl. 428-332.000.
Matsui, Ryo; Matsushika, Tadao; Hayashi, Yoshio; and Shiga, Tetsuo, 4,327,176, Cl. 430-619.000.
Murakami, Masahiro; Kobayashi, Masateru; Sone, Takanori; and Shibuya, Chisei, 4,327,211, Cl. 544-27.000.

Asaoka, Sachio; Shiroto, Yoshimi; Nakamura, Munekazu; and Ono, Takeo, to Chiyoda Chemical Engineering & Construction Co., Ltd. Process for preparing a catalyst for hydrotreatment of heavy hydrocarbon oils. 4,326,991, Cl. 252-432.000.

Ashkin, Arthur; Bjorkholm, John E.; Freeman, Richard R.; and Pearson, David B., to Bell Telephone Laboratories, Incorporated. Method for focusing neutral atoms, molecules and ions. 4,327,288, Cl. 250-251.000.

Ashley, Albert H., to United States of America, Army. DC to AC synthesizer with inverter circuit failure avoidance. 4,327,406, Cl. 363-56.000.

Asick, John C.; and Huffnagle, Clifton W., to AMP Incorporated. Connector for terminating high density cable. 4,326,764, Cl. 339-14.00R.

Astarita, Domenico: *See—*
Senni, Paolo; and Astarita, Domenico, 4,326,925, Cl. 203-37.000.

Atencio, Francisco J. G. Functionally transformable hydrostation. 4,326,819, Cl. 405-78.000.

Athenes, Claude; Salle, Jacques E.; and Blouin, Philippe, to Le Materiel Telephonique Thomson-CSF. Clock recovery device. 4,327,442, Cl. 375-119.000.

Atlantic Richfield Company: *See—*
Di Giulio, Adolph V.; and Bauer, Jack N., 4,327,197, Cl. 521-147.000.

Aubrey, Truman. Light fixture. 4,327,402, Cl. 362-288.000.

Audibert, Francoise; and Lefrancier, Pierre, to Agence National de Valorisation de la Recherache (ANVAR). Biologically active compositions and methods of use. 4,327,085, Cl. 424-177.000.

Aue, Walter P.: *See—*
Ernst, Richard R.; and Aue, Walter P., 4,327,425, Cl. 365-152.000.

Austel, Volkhard; Reiffen, Manfred; Heider, Joachim; and Diederen, Willi, to Boehringer Ingelheim GmbH. 2-(Alkoxy-phenyl)-imidazo(4,5-b)pyridines and salts thereof. 4,327,100, Cl. 424-256.000.

Austin, Buddy J.; and Simpson, James E., to Amana Refrigeration, Inc. Microwave ovens for uniform heating. 4,327,266, Cl. 219-10.55F.

Autage, Roger; and Dupont, Georges. Valves with non-lubricated plug. 4,326,697, Cl. 251-174.000.

Automation Industries, Inc.: *See—*
Kutnyak, Thomas A., 4,326,561, Cl. 138-136.000.

Autotronic Controls, Corp.: *See—*
Merrick, James W., 4,326,493, Cl. 123-606.000.

Axelgaard, Jens; Howson, David C.; and Perhay, John A. Transcutaneous electrical muscle stimulation for treatment of scoliosis and other spinal deformities. 4,326,534, Cl. 128-421.000.

Ayano, Shinya: *See—*
Ikeda, Takashi; and Ayano, Shinya, 4,326,832, Cl. 415-219.00R.

Ayres, James T.; McAllister, David L.; and Sands, John L., to Great Lakes Chemical Corporation. Process for producing purified brominated aromatic compounds. 4,327,227, Cl. 568-639.000.

Baardson, Andrew B., to Robbins, E. H.; and Baardson, Andrew B. Power plant. 4,326,382, Cl. 60-655.000.

Babb, Albert L.; and Scribner, Belding H., to Diachem, Inc. Hemodialysis with sodium bicarbonate dialysate prepared in plural stages. 4,326,955, Cl. 210-638.000.

Babcock & Wilcox Company, The: *See—*
Kelly, Joseph J., Jr.; and Rambo, George E., 4,326,917, Cl. 376-216.000.

Bacino, Carl J.; and Lustig, Martin. Snelled hook package and packaging method. 4,326,630, Cl. 206-315.00R.

Bacquie, Serge B., to Poclain Hydraulics. Fluid mechanism with axially movable valve-seat. 4,326,450, Cl. 91-487.000.

Badalex Limited: *See—*
Stephens, Stanley W., 4,326,324, Cl. 29-25.190.

Badwal, Sukhvinder P. S.: *See—*
DeBruin, Henderikus J.; and Badwal, Sukhvinder P. S., 4,326,318, Cl. 23-232.00E.

Baier, Paul W.; Dostert, Klaus; Pandit, Madhukar; and Simons, Reinhard, to Siemens Aktiengesellschaft. Receiving circuit in an interference-suppressing communications system comprising narrow-band conventional message modulation and additional pseudo-noise phase shift keying. 4,327,438, Cl. 375-1.000.

Bailey, Denis M., to Sterling Drug Inc. Heterocyclic alkyl naphthols. 4,327,022, Cl. 260-239.00B.

Bailey, Donald L.; and Williams, Charles, to Marquest Medical Products, Inc. Syringe device with means for selectively isolating a blood sample after removal of contaminates. 4,326,540, Cl. 128-763.000.

Baillie, Kenneth D.; and Lafontan, J. Donald. Releasable toilet seat clamp. 4,326,307, Cl. 4-236.000.

Bailly, Alain: *See—*
Becavin, Henri; Bailly, Alain; and Lemerle, Philippe, 4,327,334, Cl. 333-1.000.

Bainbridge, Lester M.: *See—*
Luckowski, Edwin E.; and Bainbridge, Lester M., 4,326,729, Cl. 280-304.000.

Baird, John K.: *See—*
Cottrell, Ian W.; Baird, John K.; and Shim, Jaewon L., 4,326,970, Cl. 252-8.55D.

Baker, Frank J., II: *See—*
Shaffer, Mark A.; and Baker, Frank J., II, 4,326,515, Cl. 128-207.170.

Baker International Corporation: *See—*
McStravick, David M., 4,326,585, Cl. 166-244.00C.
McStravick, David M., 4,326,588, Cl. 166-387.000.

Balaban, Alvin R.; and Steckler, Steven A., to RCA Corporation. Dual phase-control loop horizontal deflection synchronizing circuit. 4,327,376, Cl. 358-159.000.

Balaban, John A. Racket stringing apparatus and method. 4,326,713, Cl. 273-73.00A.

Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Stripping of diffusion treated metals. 4,327,134, Cl. 427-253.000.

Baldini, Luciano: *See—*
Pallaroni, Francesco; Baldini, Luciano; and Siccardi, Alberto, 4,326,574, Cl. 150-8.000.

Baldor Electric Company: *See—*
Ballman, Frederick C., 4,326,589, Cl. 169-5.000.

Baldwin, Michelle L.: *See—*
Nitzberg, Nadine R.; Baldwin, Michelle L.; and Baldwin, Steven M., 4,326,640, Cl. 220-4.00E.

Baldwin, Steven M.: *See—*
Nitzberg, Nadine R.; Baldwin, Michelle L.; and Baldwin, Steven M., 4,326,640, Cl. 220-4.00E.

Ball, Peter: *See—*
Heitz, Walter; and Ball, Peter, 4,327,035, Cl. 260-463.000.

Ball, William J.; Cotton, Leonard; and Stewart, David G., to British Petroleum Company Limited, The. Process for the production of C_1 to C_4 oxygenated hydrocarbons. 4,327,190, Cl. 518-714.000.

Ballerstein, George B.; and Kimmel, Spurgeon E., to Yorktowne Paper Mills, Inc. Cutoff machine for non-metallic tube stock. 4,326,438, Cl. 82-53.100.

Ballinger, Paul V. Narrow ditch trencher. 4,326,347, Cl. 37-94.000.

Ballman, Frederick C., to Baldor Electric Company. Anti-freeze arrangement for sprinkler systems. 4,326,589, Cl. 169-5.000.

Balouskus, Robert A.: *See—*
Feinberg, Stewart C.; Lundsager, Christian B.; Lundquist, Joseph T., Jr.; and Balouskus, Robert A., 4,327,164, Cl. 429-144.000.

Baltz, Gene F.; and Breckenfeld, Paul W., to Outboard Marine Corporation. Carburetor having a concentric tube fuel supply. 4,327,041, Cl. 261-41.00B.

Banda, Shunji, to Kabushiki Kaisha Suwa Seikosha. Matrix electrode construction. 4,326,776, Cl. 350-336.000.

Bandai Industry Co., Ltd.: *See—*
Ito, Hiroshi; and Tanaka, Haruyuki, 4,326,715, Cl. 273-88.000.

Banziger, Robert; Isenschmid, Roland; Menth, Anton; Muller, Rene; and Stucki, Samuel, to BBC Brown, Boveri & Company, Limited. Electrode in water electrolysis. 4,326,943, Cl. 204-290.00F.

Barkalow, Clare E., to Michigan Instruments, Inc. CPR Protocol and cardiopulmonary resuscitator for effecting the same. 4,326,507, Cl. 128-54.000.

Barksdale, Joe M.: *See—*
Hayden, Ralph P., Jr.; and Barksdale, Joe M., 4,326,701, Cl. 266-225.000.

Barmag Barmer Maschinenfabrik: *See—*
Schippers, Heinz; Schimmels, Bernd; and Salm, Dieter, 4,326,677, Cl. 242-18.0DD.

Barnowski, Henry G.: *See—*
Chandalia, Kiran B.; and Barnowski, Henry G., 4,327,194, Cl. 521-99.000.

Barr, William H., to Universal Tipping Company Incorporated. Tipping machine. 4,326,704, Cl. 270-58.000.

Barreca Products Co., Inc.: *See—*
Finnegan, Robert J., 4,326,747, Cl. 294-147.000.

Barth, Duane D., to Heritage Products Intl., Inc. Sign post. 4,326,352, Cl. 40-607.000.

BASF Aktiengesellschaft: *See—*
Buerstinghaus, Rainer; Kiehs, Karl; Siegel, Hardo; and Adolphi, Heinrich, 4,327,090, Cl. 424-203.000.
Eilingafeld, Heinz; Hansen, Guenter; Seybold, Guenther; and Zeidler, Georg, 4,327,019, Cl. 260-158.000.
Hamprecht, Gerhard; Parg, Adolf; and Koenig, Karl-Heinz, 4,327,034, Cl. 260-455.00A.
Hickmann, Eckhard; Oeser, Heinz-Guenter; and Moebius, Leander, 4,327,215, Cl. 546-176.000.
Mohr, Heinz; Hoffmann, Walter; and Vyvial, Rudolf, 4,326,434, Cl. 76-107.00C.
Rentzea, Costin; Sauter, Hubert; and Jung, Johann, 4,327,214, Cl. 546-133.000.
Schaefer, Dieter; Motz, Herbert; Mayer, Dieter; Deigner, Paul; Hack, Joachim; and Falk, Roland, 4,327,139, Cl. 428-65.000.

BASF Wyandotte Corporation: *See—*
Ramlow, Gerhard G.; Heyman, Duane A.; and Moore, Richard A., 4,327,005, Cl. 524-377.000.
Schmolka, Irving R., 4,326,977, Cl. 252-106.000.

Basseches, Mark T. Optionally fused connector device. 4,326,766, Cl. 339-31.00R.

Battelle Development Corporation: *See—*
Litchfield, John H.; and Lawhon, William T., Jr., 4,327,181, Cl. 435-176.000.

Bauer, Jack N.: *See—*
Di Giulio, Adolph V.; and Bauer, Jack N., 4,327,197, Cl. 521-147.000.

Bauman, William C.: *See—*
Lee, John M.; and Bauman, William C., 4,326,961, Cl. 210-683.000.
Watson, John D., Sr.; and Bauman, William C., 4,326,963, Cl. 210-792.000.

Baur, Rudolf, to Swiss Aluminium Ltd. Oil-in-water emulsion for cold rolling light metals. 4,326,974, Cl. 252-49.500.

Bausch & Lomb Incorporated: *See—*
Deichert, William G.; Friends, Gary D.; Melpolder, John B.; and Park, Joon S., 4,327,203, Cl. 526-279.000.

Baxter Travenol Laboratories, Inc.: *See—*
Williams, Ronald A., 4,326,518, Cl. 128-214.200.

Bayer Aktiengesellschaft: *See—*
Arend, Gunter; and Feyen, Peter, 4,327,040, Cl. 260-973.000.
Charlet, Egbert; and Kludas, Martin, 4,327,078, Cl. 424-45.000.
Druschke, Frank; Margotte, Dieter; Cohnen, Wolfgang; and Idel, Karsten, 4,327,015, Cl. 524-162.000.
Heitz, Walter; and Ball, Peter, 4,327,035, Cl. 260-463.000.
Jautelat, Manfred; Arlt, Dieter; Lantzsch, Reinhard; Fuchs, Rainer; Riebel, Hans-Jochem; Schroder, Rolf; and Harnisch, Horst, 4,327,025, Cl. 260-338.000.
Lehr, Gunter; Hucks, Uwe; Vernaleken, Hugo; Nielinger, Werner; and Tresper, Erhard, 4,327,208, Cl. 528-323.000.
Schmidt, Adolf; and Bockmann, August, 4,327,004, Cl. 524-745.000.
Timmler, Helmut; Buchel, Karl; Brandes, Wilhelm; Froïberger, Paul-Ernst; and Scheinpflug, Hans, 4,327,104, Cl. 424-269.000.

Bayne, Robert T.; and Shireman, Phillip E., to Standard Change-Makers, Inc. Magnetic ticket dispenser. 4,326,643, Cl. 221-13.000.

BBC Brown, Boveri & Company, Limited: *See—*
Banziger, Robert; Isenschmid, Roland; Menth, Anton; Muller, Rene; and Stucki, Samuel, 4,326,943, Cl. 204-290.00F.
Horvath, Imre; and Kwasnitza, Kurt, 4,327,244, Cl. 174-15.00S.
Nagel, Hartmut; and Stucki, Samuel, 4,326,930, Cl. 204-20.000.

Beam, John E.: *See—*
Puglia, Wayne J.; Patanasinth, Kanit J.; Lombardo, Andrew T.; Beam, John E.; and Mackay, Donald A. M., 4,327,076, Cl. 424-38.000.

Beard, George W.; and Mulvaney, James M., to Beard, George W. Security system. 4,327,353, Cl. 340-64.000.

Becavin, Henri; Bailly, Alain; and Lemerle, Philippe, to Thomson-CSF. Multi-channel rotary joint for electromagnetic detection equipment. 4,327,334, Cl. 333-1.000.

Becher, Albert F.: *See—*
King, Paul V.; Becher, Albert F.; and Henderson, Wilmer P., 4,326,468, Cl. 109-49.500.

Beck, William P., to Borg-Erickson Corporation. Electronic weighing apparatus. 4,326,596, Cl. 177-178.000.

Becton, Dickinson and Company: *See—*
Buck, Robert T.; and Horres, Charles R., 4,326,526, Cl. 128-272.000.
Stetter, Joseph R.; and Rutt, Donald R., 4,326,927, Cl. 204-1.00T.

Bednar, Robert M. Soccer cuff. 4,326,299, Cl. 2-22.000.

Beecham Group Limited: *See—*
Evans, John M.; and Markwell, Roger E., 4,327,099, Cl. 424-256.000.
Smith, Paul, 4,327,228, Cl. 568-705.000.

Beer, Robert E.; and Anderson, Conrad V., to Pako Corporation. Transport system for processor of photosensitive web material. 4,326,791, Cl. 354-321.000.

Begue, Bernard, to Vallourec. Apparatus to equalize in height, by hammering, the line of welding of longitudinally welded tubes. 4,326,398, Cl. 72-193.000.

Behle, Gunter R., to ACF Industries, Incorporated. Top operated tank car bottom outlet valve assembly installed from the bottom of the car. 4,326,557, Cl. 137-316.000.

Behlke, Darwin D.: *See—*
Black, James B.; Behlke, Darwin D.; and Steinhagen, Horst G., 4,326,433, Cl. 74-740.000.

Beigl, William. Snap-on convex rear view mirror for bicycles. 4,326,774, Cl. 350-307.000.

Belden Corporation: *See—*
Kincaid, John W., 4,327,246, Cl. 174-36.000.

Bell Telephone Laboratories, Incorporated: *See—*
Ashkin, Arthur; Bjorkholm, John E.; Freeman, Richard R.; and Pearson, David B., 4,327,288, Cl. 250-251.000.
Coldren, Larry A., 4,327,340, Cl. 333-195.000.
Feldman, Martin; White, Alan D.; and White, Donald L., 4,326,805, Cl. 356-399.000.
Howard, Richard E.; and Hu, Evelyn L., 4,326,911, Cl. 156-643.000.
Turner, Gary A., 4,327,411, Cl. 364-900.000.

Bello, Ernesto; Kolber, Steven N.; and Coulter, Wallace H., to Coulter Electronics, Inc. Level sensor apparatus and method. 4,326,851, Cl. 23-230.00R.

Bemiss, James M., to Cadillac Gage Company. Armored underbody for road vehicle. 4,326,445, Cl. 89-36.00F.

Bender, Fredrick L., to Bender's Sales & Service, Inc. Coupling construction. 4,326,749, Cl. 298-22.00R.

Bender's Sales & Service, Inc.: *See—*
Bender, Fredrick L., 4,326,749, Cl. 298-22.00R.

Bendit, Jean-Pierre; Pellaux, Jean-Paul; and Widmer, Georges. Process and device for fusion joining of fiber-optics fibers. 4,326,870, Cl. 65-4.210.

Bendix Corporation, The: *See—*
Harper, Patrick D., 4,327,394, Cl. 361-154.000.
Kelso, Charles R.; and Mayer, Endre A., 4,327,345, Cl. 335-265.000.
Pauwels, Edward M., 4,326,608, Cl. 188-181.00T.
Punako, Stephen, 4,326,768, Cl. 339-143.00R.
Remus, Casimer F., 4,327,347, Cl. 336-120.000.

Benedictus, Jorn D., to Connaught Laboratories Incorporated. Purification of influenza sub-unit vaccine. 4,327,182, Cl. 435-239.000.

Benichou, Alain. Bedding anchorage rods. 4,326,890, Cl. 106-77.000.

Benkmann, Christian, to Linde Aktiengesellschaft. Pressure buildup technique in pressure swing adsorption process. 4,326,858, Cl. 55-26.000.

Bennett, Bill B.: *See—*
King, Don G.; and Bennett, Bill B., 4,327,312, Cl. 315-378.000.

Benoit, Gordon L.; Bustin, Franz; and Donaldson, Jack J., to Mobil Oil Corporation. Thermoplastic bags having stress relief feature at handle connection. 4,326,664, Cl. 229-54.00R.

Bensley, Douglas W. Method of making footwear. 4,326,313, Cl. 12-142.00D.

Bentley, Peter D.; and Pollock, James F., to United Kingdom Atomic Energy Authority. Condensation heating apparatus. 4,327,271, Cl. 219-85.00E.

Bentrem, George A. Fireplace grate. 4,326,496, Cl. 126-164.000.

Berg, Lloyd; McCandless, Frank P.; and Ramer, Ronald J., to United States of America, Energy. Catalyst for hydrotreating carbonaceous liquids. 4,326,995, Cl. 252-465.000.

Berg, Norman J.; Casseday, Michael W.; Lee, John N.; and Abramovitz, Irwin J., to United States of America, Army. Acousto-optic time integrating correlator. 4,326,778, Cl. 350-358.000.

Bergman, Raymond A. Apparatus for transferring a workpiece in an air float system. 4,326,831, Cl. 414-676.000.

Berlin, Howard M., to United States of America, Army. Gas sensor. 4,327,361, Cl. 340-634.000.

Bernardi, Luigi; Masi, Paolo; Suarato, Antonino; and Arcamone, Federico, to Farmitalia Carlo Erba S.p.A. Anthracycline derivatives, their preparation and use. 4,327,029, Cl. 260-351.100.

Bernhardt, Winfried; Grundmann, Edgard; and Kroll, Rudolf, to Volkswagenwerk Aktiengesellschaft. Solar radiation collector. 4,326,500, Cl. 126-426.000.

Bert, Alain, to Thomson-CSF. Solid state microwave source and radio equipment incorporating such a source. 4,327,339, Cl. 331-107.00P.

Berte, Frank J., to Massachusetts Institute of Technology. Sailboat. 4,326,475, Cl. 114-39.000.

Bessey, Marlin L.: *See*—
Leibrand, John G., Sr.; and Bessey, Marlin L., 4,326,492, Cl. 123-557.000.

Betta, Enrico: *See*—
Imparato, Luigi; Gerbaz, Giampaolo; and Betta, Enrico, 4,327,237, Cl. 585-648.000.

Betz Laboratories, Inc.: *See*—
Jones, Robert L.; Volgenau, Lewis; and Davis, Philip S., 4,326,962, Cl. 210-698.000.
Snyder, William R.; and Feuerstein, Diane, 4,326,980, Cl. 252-180.000.

Beznosjuk, Evgeny I.; Doktorov, Leonid B.; Musyakin, Vyacheslav E.; and Kolomeets, Sergei V. Rotating cutting tool. 4,326,823, Cl. 407-51.000.

Bicksler, William B.: *See*—
Schillinger, Joseph F.; Bicksler, William B.; and Lambert, Herbert L., 4,326,633, Cl. 206-418.000.

Bieffe S.P.A.: *See*—
Pallaroni, Francesco; Baldini, Luciano; and Siccardi, Alberto, 4,326,574, Cl. 150-8.000.

Billet, Rene, to Societe Anonyme Francaise du Ferodo. Diaphragm clutch cover assembly. 4,326,611, Cl. 192-89.00B.

Bishop, Craig V.: *See*—
Eckles, William E.; Bishop, Craig V.; and Vaitekunas, Peter T., 4,326,940, Cl. 204-232.000.

BJ-Hughes Inc.: *See*—
Sheldon, Loren B., 4,327,261, Cl. 200-61.410.

Bjorkholm, John E.: *See*—
Ashkin, Arthur; Bjorkholm, John E.; Freeman, Richard R.; and Pearson, David B., 4,327,288, Cl. 250-251.000.

Black Clawson Company, The: *See*—
Phelps, Richard W.; and Tetro, Richard S., 4,326,679, Cl. 242-56.00A.
Tetro, Richard S.; and Harmon, Paul E., 4,326,680, Cl. 242-56.00A.

Black, James B.; Behlke, Darwin D.; and Steinhagen, Horst G., to Twin Disc, Incorporated. Hydraulically controlled power transmission having friction plate clutches for selectively engaging a plurality of change speed gears. 4,326,433, Cl. 74-740.000.

Blackwell, Joseph T., III, to Ciba-Geigy Corporation. Process for the production of methomyl oxime. 4,327,033, Cl. 260-453.300.

Blaimschein, Gottfried: *See*—
Kralowetz, Bruno; and Blaimschein, Gottfried, 4,326,323, Cl. 29-6.000.

Blair, Charles M., Jr., to Magna Corporation. Method for breaking petroleum emulsions and the like using micellar solutions of thin film spreading agents comprising polyepoxide condensates of resinous polyalkylene oxide adducts and polyether polyols. 4,326,968, Cl. 252-8.55D.

Blair, Charles M., Jr., to Magna Corporation. Micellar solutions of thin film spreading agents comprising a polyether polyol. 4,326,983, Cl. 252-358.000.

Blair, Charles M., Jr., to Magna Corporation. Micellar solutions of thin film spreading agents comprising polyepoxide condensates or resinous polyalkylene oxide adducts and polyether polyols. 4,326,984, Cl. 252-358.000.

Blair, Charles M., Jr., to Magna Corporation. Micellar solutions of thin film spreading agents comprising an acylated polyether polyol. 4,326,985, Cl. 252-358.000.

Blake, Gene J. Precious metal recovery apparatus. 4,326,952, Cl. 210-85.000.

Bleckmann, Ingo. Heater for heating flows of fluid and dishwashing machine provided therewith. 4,326,552, Cl. 134-99.000.

Bleikolm, Anton: *See*—
Leitner, Wolfgang; Pampouchidis, Georg; and Bleikolm, Anton, 4,327,200, Cl. 525-531.000.

Blessum, Norman S.: *See*—
DeMoss, Dean; Blessum, Norman S.; Gyi, Ko Ko; and Ragle, Herbert U., 4,327,386, Cl. 360-99.000.

Blomgren, George E.: *See*—
Jones, Steven D.; and Blomgren, George E., 4,327,159, Cl. 429-101.000.
Jones, Steven D.; and Blomgren, George E., 4,327,160, Cl. 429-101.000.

Blomqvist, Ake; and Dahlberg, Kurt, to Aktiebolaget Bofors. Device for aiming of a weapon. 4,326,340, Cl. 33-238.000.

Bloomquist, Wilburn M.: *See*—
Sabatka, Winston E.; and Bloomquist, Wilburn M., 4,326,933, Cl. 204-129.600.

Blouin, Philippe: *See*—
Athenes, Claude; Salle, Jacques E.; and Blouin, Philippe, 4,327,442, Cl. 375-119.000.

Blum, Helmut; and Worms, Karl-Heinz, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Process for the production of 3-amino-1-hydroxypropane-1,1-diphosphonic acid. 4,327,039, Cl. 260-502.500.

Board of Governors, Wayne State Univ.: *See*—
Chen, Kuo-Chun, 4,327,180, Cl. 435-173.000.

Bockmann, August: *See*—
Schmidt, Adolf; and Bockmann, August, 4,327,004, Cl. 524-745.000.

Boehringer Ingelheim GmbH: *See*—
Austel, Volkhard; Reiffen, Manfred; Heider, Joachim; and Diederen, Willi, 4,327,100, Cl. 424-256.000.
Brickl, Rolf; and Eberhardt, Hans, 4,327,114, Cl. 424-331.000.
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Lillie, Christian, 4,327,106, Cl. 424-273.00R.

Boettger, Erhard: *See*—
Jager, Wolfgang; and Boettger, Erhard, 4,327,281, Cl. 219-523.000.

Boggs, John W.: *See*—
Gradek, Walter A.; and Boggs, John W., 4,326,655, Cl. 224-324.000.

Boiardi, Mario J. Paving stone and walkway formed therewith. 4,326,817, Cl. 404-41.000.

Bolin, Philip C.: *See*—
Hopkins, Melvyn D.; and Bolin, Philip C., 4,327,243, Cl. 174-14.00R.

Bolton, Deborah A.; and Schaefer, Jean E., to Buckeye Cellulose Corporation, The. Belt package with temporarily secured detachable belt end. 4,326,300, Cl. 2-114.000.

Bonneyrat, Alain M.: *See*—
Gilson, Robert E.; Foster, George W.; and Bonneyrat, Alain M., 4,326,837, Cl. 417-12.000.

Bonsall, Samuel B., to Eltra Corporation. Refractory compositions with binder. 4,327,185, Cl. 501-89.000.

Booth, John L.: *See*—
Rittmaster, Peter A.; and Booth, John L., 4,326,380, Cl. 60-595.000.

Borg-Erickson Corporation: *See*—
Beck, William P., 4,326,596, Cl. 177-178.000.

Borg-Warner Corporation: *See*—
Burgin, Albert J., 4,327,298, Cl. 307-66.000.

Borger, Waldemar, to Varta Batterie Aktiengesellschaft. Battery terminal for high temperature batteries. 4,327,162, Cl. 429-120.000.

Bornefeld, Horst; Fort, Hans P.; and Engel, Werner, to Goetze AG. Method of identifying piston rings. 4,326,907, Cl. 156-212.000.

Bosse-Platiere, Michel J.: *See*—
Garcia, Jose B.; and Bosse-Platiere, Michel J., 4,326,462, Cl. 102-310.000.

Bostwick, Lewis S.; Filosa, Albert V.; and LaTorre, Richard R., to Raytheon Company. Two degree of freedom rate gyroscope. 4,326,428, Cl. 74-5.00F.

Botz, Jakob; Feger, Rolf; Mutschler, Erich; Spazierer, Hubert; and Weber, Adam, to ITT Industries, Inc. Fastening device for a switch. 4,327,264, Cl. 200-295.000.

Bouillet, Edmond: *See*—
Logan, William R.; Sarot, Pierre; and Bouillet, Edmond, 4,326,976, Cl. 252-99.000.

Bouillon, Claude; Vayssie, Charles; and Richard, Francoise, to L'Oreal. Anti-solar cosmetic composition. 4,327,031, Cl. 260-429.900.

Bouvet, Jean-Victor: *See*—
Henry, Raymond; Bouvet, Jean-Victor; Chapard, Alain; and Simon, Jacques, 4,326,771, Cl. 350-96.170.

Bradley, Daniel J. Electron-optical image tubes and streak cameras. 4,327,285, Cl. 250-213.0VT.

Bradley, Terrag W.: *See*—
Schafter, William; and Bradley, Terrag W., 4,327,366, Cl. 346-76.0PH.

Bradshaw, David H., to Texas Instruments Incorporated. Method and apparatus for synchronizing and calibrating a receiver to a pulse width modulation transmitter. 4,327,441, Cl. 375-113.000.

Branca, Quirico; Fischli, Albert E.; and Szente, Andre', to Hoffmann-La Roche Inc. Benzodiazepine derivatives. 4,327,026, Cl. 260-239.30D.

Brancaleone, Salvatore T., to International Telephone and Telegraph Corporation. Electronic device carrier. 4,326,765, Cl. 339-17.0CF.

Brandes, Wilhelm: *See*—
Timmler, Helmut; Buchel, Karl; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,327,104, Cl. 424-269.000.

Brandon, Eugene M.: *See*—
Ripley, Robert H.; Karsten, Robert W.; Brandon, Eugene M.; and Lockerby, James W., 4,327,011, Cl. 524-474.000.

Branovich, Louis E.; Daly, Edward; Newman, Albert F.; and Smith, Willis M., to United States of America, Army. Method of coating a ceramic substrate. 4,327,131, Cl. 427-229.000.

Branson Ultrasonics Corporation: *See*—
Summo, Arthur M., 4,326,903, Cl. 156-73.100.

Braun, Ernst; and Braun, Gert, to Halbach & Braun. Device for the homogenization of material to be crushed. 4,326,674, Cl. 241-35.000.

Braun, Gert: *See*—
Braun, Ernst; and Braun, Gert, 4,326,674, Cl. 241-35.000.

Breckenfeld, Paul W.: *See*—
Baltz, Gene F.; and Breckenfeld, Paul W., 4,327,041, Cl. 261-41.00B.

Brent, Albert: *See*—
Muenger, James R.; Child, Edward T.; and Brent, Albert, 4,326,856, Cl. 48-197.00R.

Breslow, Jeffrey D.; and Erickson, Erick E., to Marvin Glass & Associates. Talking electronic game. 4,326,710, Cl. 273-1.00E.

Brickl, Rolf; and Eberhardt, Hans, to Boehringer Ingelheim GmbH. Substituted 1,8-dihydroxy-9-(10H)anthracenones. 4,327,114, Cl. 424-331.000.

British Petroleum Company Limited, The: *See—*
Ball, William J.; Cotton, Leonard; and Stewart, David G., 4,327,190, Cl. 518-714.000.

Brock, Josef; and Surkamp, Paul, to Maschinenfabrik Carl Zangs Aktiengesellschaft. Control for a dobby mechanism. 4,326,563, Cl. 139-76.000.

Brock, Louis C. Collapsible sunshade. 4,326,301, Cl. 2-177.000.

Brockwell, Ian P., to Alfa Laval Pty Ltd. Slat conveyors. 4,326,626, Cl. 198-845.000.

Brook, Jon: *See—*
Brown, Mike; and Brook, Jon, 4,326,573, Cl. 150-0.500.

Brooks, Robert B., to General Electric Company. Apparatus and method for thawing frozen food. 4,326,390, Cl. 62-382.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Yamashita, Chikao; Sugaya, Takao; and Yoshida, Noriyuki, 4,326,472, Cl. 112-158.00D.

Brown, E. B. Alarm device responsive to movement of protected object, power source condition and alarm ground path. 4,327,360, Cl. 340-571.000.

Brown, Mike; and Brook, Jon. Deformable fuel cell. 4,326,573, Cl. 150-0.500.

Brown Wooten Mills, Inc.: *See—*
Dunlap, Albert R., 4,326,393, Cl. 66-172.00E.

Broz, Frank J. Electrostatic mineral concentrator. 4,326,951, Cl. 209-127.00R.

Bruning, Rolf; and Roth, Jurgen, to Heraeus Quarzschmelze GmbH. Apparatus for the combustion of harmful gases. 4,327,057, Cl. 422-173.000.

Brusasco, Enzo. Device for adjusting the relative angular position of two elements. 4,326,748, Cl. 297-362.000.

Bryant, Bill R., to Houston Tong Services, Inc. Portable stabbing board. 4,326,602, Cl. 182-82.000.

Bryant, Richard W., to National Semiconductor Corporation. Integrated organ circuit. 4,326,443, Cl. 84-1.260.

Bryer, Robert P.: *See—*
Davis, Brian C.; and Bryer, Robert P., 4,327,021, Cl. 524-297.000.

Buchel, Karl: *See—*
Timmler, Helmut; Buchel, Karl; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,327,104, Cl. 424-269.000.

Buck, Robert T.; and Horres, Charles R., to Becton, Dickinson and Company. Dialysate bag assembly for continuous ambulatory peritoneal dialysis. 4,326,526, Cl. 128-272.000.

Buckeye Cellulose Corporation, The: *See—*
Bolton, Deborah A.; and Schaefer, Jean E., 4,326,300, Cl. 2-114.000.

Buckles, Richard G., to World Health Organization. Barrier contraceptive torus. 4,326,510, Cl. 128-127.000.

Buerstinghaus, Rainer; Kiehs, Karl; Siegel, Hardo; and Adolphi, Heinrich, to BASF Aktiengesellschaft. Oximinophosphoric acid derivatives, their preparation and their use in pest control. 4,327,090, Cl. 424-203.000.

Buholtz, William F., to Burroughs Corporation. Full cantilever structural support apparatus for rotatable electrophotographic drum. 4,326,793, Cl. 355-3.0DR.

Bukhtiyarov, Ivan D.; An, Viktor B.; Farshatov, Marat N.; Sapozhnikov, Fedor F.; Sidorov, Anatoly G.; Proskurina, Natalya A.; and Marakin, Vladimir I. Engine test method. 4,326,410, Cl. 73-117.300.

Bunyan, Thomas W., to Pilgrim Engineering Developments Limited. Bolts and methods of bolting. 4,326,826, Cl. 411-339.000.

Burchett, Lawrence R. Fuel heater. 4,326,491, Cl. 123-557.000.

Burdeska, Kurt: *See—*
Liechti, Hans W.; Burdeska, Kurt; and Markert, Jurgen, 4,327,018, Cl. 260-156.000.

Burghoff, Hans: *See—*
Murzin, Horst; Woss, Rainer; Burghoff, Hans; Schmieder, Frank; Herzig, Alfred; Junge, Johannes; and Deckarm, Gunter, 4,326,625, Cl. 198-653.000.

Burgin, Albert J., to Borg-Warner Corporation. Battery backup system for a microcomputer. 4,327,298, Cl. 307-66.000.

Burke, James W. Starting fluid injection apparatus. 4,326,485, Cl. 123-180.0AC.

Burke, Leonard F.; and Dean, Arthur P., to United States of America, Army. Dye marker assembly for rocket practice round. 4,326,463, Cl. 102-513.000.

Burklin, Werner. Process and apparatus for preparing compostable material. 4,326,874, Cl. 71-9.000.

Burnham, Gerald E., Sr. Degassing of drilling fluids. 4,326,859, Cl. 55-52.000.

Burns, Robert B., to Texaco Development Corporation. Method for drilling deviated wells into an offshore substrate. 4,326,595, Cl. 175-9.000.

Burroughs Corporation: *See—*
Buholtz, William F., 4,326,793, Cl. 355-3.0DR.
DeMoss, Dean; Blessum, Norman S.; Gyi, Ko Ko; and Ragle, Herbert U., 4,327,386, Cl. 360-99.000.
Genter, Melvyn E.; and Potash, Hanan, 4,327,355, Cl. 340-825.900.

Burrows, James L., to Sanders Associates, Inc. Data driven processor. 4,327,407, Cl. 364-200.000.

Burton, Charles A.; and Russell, Robert C., to Rexham Corporation. Packaging machine with continuous motion filler. 4,326,568, Cl. 141-114.000.

Bus, Jan; Mohlmann, Willem M. M.; and Pritchard, Norman J., to Lever Brothers Company. Non-aqueous, built liquid detergent composition and method for preparing same. 4,326,979, Cl. 252-158.000.

Bustin, Franz: *See—*
Benoit, Gordon L.; Bustin, Franz; and Donaldson, Jack J., 4,326,664, Cl. 229-54.00R.

B.V. Beheermaatschappij T. denBreejen van den Bout: *See—*
van Dee, Nicolaas F., 4,326,346, Cl. 37-72.000.

Cadet, Andre, to Compagnie Francaise de Raffinage. Process for storing heat with a eutectic composition containing at least one saturated aliphatic hydrocarbon and at least one fatty acid. 4,326,975, Cl. 252-70.000.

Cadillac Gage Company: *See—*
Bemiss, James M., 4,326,445, Cl. 89-36.00F.

Cadwell, Dennis J., to Westinghouse Electric Corp. Control rod guide thimble for nuclear reactor fuel assemblies. 4,326,921, Cl. 376-353.000.

Calamari, James A., Jr.: *See—*
Nyman, Frederick R.; Stevens, Barry; and Calamari, James A., Jr., 4,327,048, Cl. 264-107.000.

Calcol, Inc.: *See—*
Kaplan, Norman C., 4,327,028, Cl. 260-345.300.

Cale, Albert D., Jr., to A. H. Robins Company, Inc. Pharmaceutical compositions useful in the treatment of cardiovascular hypertension and containing 4-substituted-2-iminoimadazolidine compounds. 4,327,098, Cl. 424-250.000.

Cale, Albert D., Jr., to A. H. Robins Company, Inc. Method useful in the treatment of sugar cataracts using 4-substituted-2-iminoimidazolidine compounds. 4,327,107, Cl. 424-273.00R.

Cale, Albert D., Jr., to A. H. Robins Company, Inc. Methods useful in the treatment of cardiac arrhythmia using 4-substituted-2-iminoimidazolidine compounds. 4,327,108, Cl. 424-273.00R.

Calgon Corporation: *See—*
Reilly, Phillip B.; and Ralston, Paul H., 4,326,873, Cl. 65-134.000.

Calucci, Edward J.: *See—*
Stratton, Roy F.; and Calucci, Edward J., 4,327,306, Cl. 313-419.000.

Cambridge Collaborative, Inc.: *See—*
Fredberg, Jeffrey J., 4,326,416, Cl. 73-597.000.

Camilleri, Thomas M. Positive cycle mechanism for bowling pinsetter. 4,326,712, Cl. 273-43.00R.

Campbell, Larry J., to Eaton Corporation. Shielded electrical cable. 4,327,248, Cl. 174-107.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Cornish, William D., 4,327,343, Cl. 333-218.000.

Canevari, Gerard P., to Exxon Research & Engineering Co. Composition and method for suppressing vapor loss of volatile hydrocarbons. 4,326,986, Cl. 252-384.000.

Canica Crushers, Ltd.: *See—*
Rose, Neil M., 4,326,676, Cl. 241-275.000.

Canon Kabushiki Kaisha: *See—*
Aoki, Kanemasa, 4,327,304, Cl. 310-266.000.
Aoyagi, Masao; and Kamata, Shigeru, 4,326,789, Cl. 354-286.000.
Hirata, Noritsugu; Toyama, Masamichi; Okajima, Hidekazu; and Nishimura, Akimasa, 4,326,790, Cl. 354-288.000.
Ichiyanagi, Toshikazu, 4,326,784, Cl. 354-53.000.
Miyamoto, Koichi; Kan, Yasuhito; Nitanda, Hiroshi; and Ariga, Masao, 4,326,797, Cl. 355-57.000.
Noda, Atsushi, 4,327,365, Cl. 346-76.0PH.
Okajima, Hidekazu, 4,326,782, Cl. 352-91.00C.
Senuma, Michio, 4,326,787, Cl. 354-246.000.
Tajima, Hatsuo; Iwami, Naoki; Masuda, Shunichi; Shimizu, Katsuichi; Kawatsura, Yoshihiro; Suzuki, Koji; and Yokomizo, Yoshikazu, 4,326,795, Cl. 355-14.00E.
Uchiyama, Takashi; Suzuki, Ryoichi; Saito, Syuichiro; and Sugiura, Yoji, 4,326,786, Cl. 354-234.000.

Canon Seiki Kabushiki Kaisha: *See—*
Aoki, Kanemasa, 4,327,304, Cl. 310-266.000.

Capostagno, Joseph A.; Chan, Kingsley; and Kartavenko, Alexandre, to Lightolier Incorporated. Lighting fixture with uniform mounting frame for old installations. 4,327,403, Cl. 362-306.000.

Capshew, Charles E.: *See—*
Welch, Melvin B.; Dietz, Richard E.; and Capshew, Charles E., 4,326,988, Cl. 252-429.00B.

Capuano, Italo A.; Turley, Patricia A.; and DuBord, Edward W., to Olin Corporation. Sodium amalgam monitor. 4,326,850, Cl. 23-230.00R.

Carl Walther GmbH: *See—*
Ludwig, Walter; and Schmid, Franziska, deceased, 4,326,353, Cl. 42-7.000.

Carneim, Wilfried; Hillemanns, Herbert; Vollmecke, Hermann; Ribken, Hans; Schumacher, Heinz; and Roether, Kurt, to Mannesmann Aktiengesellschaft. Oil-tempering apparatus for pipes. 4,326,699, Cl. 266-114.000.

Carter, Rory A. C., to Vosper Hovermarine Limited. Gas-cushion vehicles. 4,326,477, Cl. 114-67.00A.

Casbohm, Chris E.: *See—*
Sherrick, James W.; and Casbohm, Chris E., 4,326,670, Cl. 238-341.000.

Cashman, Richard J., to Produce Processors International Corporation. Racing sulky and harness. 4,326,367, Cl. 54-2.000.

Casseday, Michael W.: *See—*
Berg, Norman J.; Casseday, Michael W.; Lee, John N.; and Abramovitz, Irwin J., 4,326,778, Cl. 350-358.000.

Caterpillar Tractor Co.: *See—*
Goloff, Alexander, 4,326,672, Cl. 239-91.000.

CDC Life Sciences Inc.: *See—*
Micetich, Ronald G.; Shaw, Chia-Cheng; and Rastogi, Ram B., 4,327,222, Cl. 548-247.000.
Cegedur Societe de Transformation de l'Aluminium Pechiney: *See—*
Colas, Francois, 4,326,773, Cl. 350-292.000.
Ceintrey, Claude, to La Cellophane. Writing liquid for use with an opaque recording material for forming transparencies for overhead projection and the like. 4,327,006, Cl. 524-315.000.
Centre Electronique Horloger S.A.: *See—*
Oguey, Henri; and Gerber, Bernard, 4,327,320, Cl. 323-313.000.
Century Inks Corporation: *See—*
Ripley, Robert H.; Karsten, Robert W.; Brandon, Eugene M.; and Lockerby, James W., 4,327,011, Cl. 524-474.000.
Cerruti, Eraldo, to Fiat Auto S.p.A. Monitoring apparatus for a motor vehicle. 4,327,352, Cl. 340-52.00F.
Ceskoslovenska akademie ved: *See—*
Novak, Jan; Sorm, Miloslav; Ulbert, Karel; Nespurek, Stanislav; Mikulcova, Dagmar; and Cmolik, Jiri, 4,326,966, Cl. 252-8.800.
Chafetz, Harry: *See—*
Hammond, Kenneth G.; and Chafetz, Harry, 4,326,973, Cl. 252-34.000.
Chakupurakal, Thomas, to General Motors Corporation. Evaporated electrodes for zirconia exhaust gas oxygen sensors. 4,327,122, Cl. 427-57.000.
Chamberlin, William B., III, to Lubrizol Corporation, The. Concentrates, lubricant compositions and methods for improving fuel economy of internal combustion engine. 4,326,972, Cl. 252-33.300.
Chambers, Robert W.; and Cuomo, Frank, Jr., to RCA Corporation. Method and apparatus for deflashing molded recorded discs. 4,326,325, Cl. 29-27.00C.
Champion International Corporation: *See—*
Schillinger, Joseph F.; Bicksler, William B.; and Lambert, Herbert L., 4,326,633, Cl. 206-418.000.
Scott, Raymond G., 4,326,665, Cl. 229-87.00R.
Thompson, Kenneth P.; and Ihde, Richard C., 4,327,136, Cl. 428-35.000.
Champion, James R.; Ernst, Larry M.; Ford, Leland W.; and Velarde, Ronald G., to International Business Machines Corporation. Apparatus and method for measuring and maintaining copy quality in an electrophotographic copier. 4,326,796, Cl. 355-14.0CH.
Chan, Kingsley: *See—*
Capostagno, Joseph A.; Chan, Kingsley; and Kartavenko, Alexandre, 4,327,403, Cl. 362-306.000.
Chandalia, Kiran B.; and Barnowski, Henry G., to Olin Corporation. Flexible polyurethane foam prepared from a reaction mixture which includes a polyether triol containing an effectively dispersed finely divided solid particulate material. 4,327,194, Cl. 521-99.000.
Chang, M. C.: *See—*
Hao, Paul L. C.; Hsu, W. W.; Lin, W. S.; Tong, S. N.; Hung, H. K.; and Chang, M. C., 4,327,003, Cl. 523-336.000.
Chapard, Alain: *See—*
Henry, Raymond; Bouvet, Jean-Victor; Chapard, Alain; and Simon, Jacques, 4,326,771, Cl. 350-96.170.
Chapman, Richard A.; Kinch, Michael A.; and Hynecek, Jaroslav, to Texas Instruments Incorporated. Infrared charge injection device imaging system. 4,327,291, Cl. 250-332.000.
Chapski, David L.: *See—*
Stearns, Charles F.; Chapski, David L.; and Vosseller, Kenneth F., 4,326,376, Cl. 60-39.28R.
Charlet, Egbert; and Kludas, Martin, to Bayer Aktiengesellschaft. Cosmetic agents including soluble elastin. 4,327,078, Cl. 424-45.000.
Chatlos, Richard, to Air O Scoop Corporation. Attachment for motor vehicles with rear windows. 4,326,451, Cl. 98-2.120.
Chemie Linz Aktiengesellschaft: *See—*
Groke, Karl, 4,327,084, Cl. 424-176.000.
Chen, Kuo-Chun, to Board of Governors, Wayne State Univ. Method and apparatus for electromagnetic radiation of biological material. 4,327,180, Cl. 435-173.000.
Cheng, Paul J., to Phillips Petroleum Company. Process for making carbon black. 4,327,069, Cl. 423-450.000.
Chester, Arthur W.; and Stover, William A., to Mobil Oil Corporation. Novel cracking catalysts and catalyst supports. 4,326,993, Cl. 252-455.00Z.
Chevron Research: *See—*
Ziman, Stephen D., 4,326,878, Cl. 71-92.000.
Chevron Research Company: *See—*
Aoyagi, Edward I., 4,326,876, Cl. 71-090.000.
Chicago Lock Co.: *See—*
Steinbach, Robert L., 4,326,396, Cl. 70-364.00R.
Chikata, Tsukasa; Sunami, Yoshihiko; Sasaki, Keiichi; and Nishioka, Kunihiko, to Sumitomo Metal Industries Ltd. Process for manufacture of solvent for coal liquefaction. 4,326,946, Cl. 208-93.000.
Child, Edward T.: *See—*
Muenger, James R.; Child, Edward T.; and Brent, Albert, 4,326,856, Cl. 48-197.00R.
Chinon Industries Incorporation: *See—*
Ogura, Wataru, 4,326,781, Cl. 352-14.000.
Chitty, John A.: *See—*
Ruhe, Anthony; Chitty, John A.; and Nickerson, James H. D., 4,326,897, Cl. 148-13.100.
Chiu, Kuen-Wai; and Strickler, John R., to Mine Safety Appliances Company. Method of preparing potassium hydride. 4,327,071, Cl. 423-646.000.
Chiyoda Chemical Engineering & Construction Co., Ltd.: *See—*
Asaoka, Sachio; Shiroto, Yoshimi; Nakamura, Munekazu; and Ono, Takeo, 4,326,991, Cl. 252-432.000.
Christenson, Roger M.: *See—*
Schimme, Karl F.; Seiner, Jerome A.; Christenson, Roger M.; and Dowbenko, Rostyslaw, 4,327,008, Cl. 524-104.000.
Christison, Alan M., to Product Technologies, Inc. Cooling system for automatic bowling pin spotter. 4,327,398, Cl. 361-384.000.
Christopher, Todd J., to RCA Corporation. Video disc stylus position sensor system. 4,327,434, Cl. 369-220.000.
Chung, Alfred: *See—*
Ryan, James W.; and Chung, Alfred, 4,327,178, Cl. 435-23.000.
Chuwman, Tsutomu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Anti-rust structure of an adjust mechanism in a drum brake. 4,326,607, Cl. 188-79.50S.
Ciba-Geigy Corporation: *See—*
Blackwell, Joseph T., III, 4,327,033, Cl. 260-453.300.
Liechti, Hans W.; Burdeska, Kurt; and Markert, Jurgen, 4,327,018, Cl. 260-156.000.
Lienhard, Paul; and L'Eplattenier, Francois, 4,327,212, Cl. 544-225.000.
Lohse, Friedrich; Schmid, Rolf; and Fatzer, Willy, 4,327,032, Cl. 260-448.00R.
Martin, Pierre, 4,327,216, Cl. 546-250.000.
Model, Ernst, 4,327,024, Cl. 260-325.0PH.
Moesch, Boris, 4,326,978, Cl. 252-107.000.
Muller, Horst; and Wirth, Hermann O., 4,327,000, Cl. 524-285.000.
Neumann, Konrad; and Schenkenberger, Ernst, 4,326,982, Cl. 252-301.230.
Rempfler, Hermann, 4,326,880, Cl. 71-94.000.
Schreiber, Werner, 4,327,209, Cl. 542-466.000.
Sele, Alex; Ferrini, Pier G.; Haas, Georges; Jaeggi, Knut A.; and Rossi, Alberto, 4,327,091, Cl. 424-246.000.
Wehner, Wolfgang; Muller, Horst; and Kostler, Hans-Gunter, 4,327,016, Cl. 524-180.000.
Cioca, Gheorghe; and Fertell, Paul A., to Seton Company. Polyurethane containing polypeptides. 4,327,195, Cl. 521-102.000.
Citizen Watch Company Limited: *See—*
Enomoto, Tadao; and Koide, Hiroshi, 4,327,428, Cl. 368-232.000.
Clark, Charles A., Jr., to Sperry Corporation. Voltage suppression circuit for a DC-to-DC voltage converter circuit. 4,327,405, Cl. 363-56.000.
Clark, Suzanne P.; Reynolds, George A.; and Perlstein, Jerome H., to Eastman Kodak Company. Infrared sensitive photoconductive composition, elements and imaging method using trimethine thiopyrylium dye. 4,327,169, Cl. 430-75.000.
Clarke, Donald A.: *See—*
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; Clarke, Donald A.; and Richards, Blaine, 4,326,808, Cl. 356-445.000.
Clarksville Machine Works, Inc.: *See—*
Frost, Bob L.; Leeds, Harry D.; and Eckart, Joseph E., 4,326,439, Cl. 83-27.000.
Clemens, Jon K.: *See—*
Lang, Frank B.; and Clemens, Jon K., 4,327,432, Cl. 369-126.000.
Clemons, Johnny M.: *See—*
White, William T.; Clemons, Johnny M.; and Ledbetter, Frank E., III, 4,327,150, Cl. 428-332.000.
Cleveland Machine Controls, Inc.: *See—*
Koenig, Robert G., 4,326,424, Cl. 73-862.480.
Clifford, Jack R., to Pratt, Paul L.; and Pierce, John T., Jr., part interest to each. Implement and method for cleaning tubular drains. 4,326,893, Cl. 134-8.000.
Cloutier, Marius: *See—*
Missout, Gilles; Lalonde, Francois; and Cloutier, Marius, 4,327,335, Cl. 331-1.00A.
Clyburn, C. Wayne, to James David Mfg. Corp. Plural leg stand. 4,326,687, Cl. 248-168.000.
CMI Corporation: *See—*
Rosenbaum, Glen F., 4,326,750, Cl. 298-35.00M.
Cmolik, Jiri: *See—*
Novak, Jan; Sorm, Miloslav; Ulbert, Karel; Nespurek, Stanislav; Mikulcova, Dagmar; and Cmolik, Jiri, 4,326,966, Cl. 252-8.800.
Cogswell, Frederic N.; and Mitchell, David T., to Imperial Chemical Industries Limited. Blow molding hollow articles from polyolefins containing anisotropic filler. 4,327,053, Cl. 264-515.000.
Cohnen, Wolfgang: *See—*
Druschke, Frank; Margotte, Dieter; Cohnen, Wolfgang; and Idel, Karsten, 4,327,015, Cl. 524-162.000.
Colas, Francois, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Solar energy focusing means comprising modular elements. 4,326,773, Cl. 350-292.000.
Coldren, Larry A., to Bell Telephone Laboratories Incorporated. Surface wave resonator cascade. 4,327,340, Cl. 333-195.000.
Colgate Palmolive Company: *See—*
Wixon, Harold E., 4,326,971, Cl. 252-8.750.
Colledge, Ronald J.: *See—*
Gundersen, Ray S.; Colledge, Ronald J.; Jenkins, Roy H.; and Crook, Michael, 4,326,425, Cl. 73-863.530.
Collington, Eric W.; Hallett, Peter; and Wallis, Christopher J., to Glaxo Group Limited. Aminocyclopentane alkenoic acids and esters and pharmaceutical formulations. 4,327,092, Cl. 424-246.000.
Collins, Wayne H. Apparatus for refining ore. 4,326,635, Cl. 209-474.000.
Colognori, Aldo, to Colognori, Aldo; Zuptichini, Sebastian; and McBride, Thomas. Expanding sleeve for wrist band connector. 4,326,321, Cl. 24-265.00B.

Colon, Ismael; Maresca, Louis M.; and Kwiatkowski, George T., to Union Carbide Corporation. Catalyst of nickel compound and ligand in presence of a reducing metal. 4,326,989, Cl. 252-429.00R.

Columbia Ribbon & Carbon Mfg. Co., Inc.: *See—*
Dapp, George P.; and Scott, Michael A., 4,327,127, Cl. 427-146.000.

Combustion Research, Inc.: *See—*
Ehresmann, Ewald, 4,326,490, Cl. 123-557.000.

Comision de Fomento Minero: *See—*
Soriano G., Vicente; Marino A., Carmin; and Valdez, Enrique R., 4,326,884, Cl. 75-71.000.

Commonwealth of Australia: *See—*
Toms, Maxwell H., 4,326,461, Cl. 102-277.000.

Compagnie Francaise de Raffinage: *See—*
Cadet, Andre, 4,326,975, Cl. 252-70.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Suszylo, Jacky, 4,327,255, Cl. 179-90.00K.

Compagnie Internationale pour l'Informatique CII/Honeywell Bull: *See—*
Plotto, Michel, 4,327,387, Cl. 360-103.000.

Conair Corporation: *See—*
Tomaro, John W., 4,327,278, Cl. 219-364.000.

Connaught Laboratories Incorporated: *See—*
Benedictus, Jorn D., 4,327,182, Cl. 435-239.000.

Consan Pacific Incorporated: *See—*
Saurenman, Donald G., 4,326,454, Cl. 99-451.000.

Constantino, Daniel G., to Fip, S.A. de C.V. Gate valve. 4,326,698, Cl. 251-327.000.

Conti, Armand R. Lubricating collar for cable. 4,326,605, Cl. 184-15.00R.

Controle Bailey: *See—*
Lejon, Jean, 4,326,448, Cl. 91-363.00R.

Cook, John P.: *See—*
Facha, Joseph V.; Cook, John P.; and Dauterman, William H., 4,326,920, Cl. 376-205.000.

Cooper, John H.: *See—*
Reymersdal, Joseph V.; and Cooper, John H., 4,327,423, Cl. 365-8.000.

Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Thermoplastic crystalline polyester modified acrylic copolymer rubber. 4,327,199, Cl. 525-176.000.

Cornell Research Foundation, Inc.: *See—*
Kime, Robert W., 4,327,115, Cl. 426-12.000.

Cornish, William D.; and Tucker, Trevor W., to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence. Microwave phase locked loops using FET frequency dividers. 4,327,336, Cl. 331-8.000.

Cornish, William D., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Wideband MESFET microwave frequency divider. 4,327,343, Cl. 333-218.000.

Cottell, Eric C. Process for beneficiating and stabilizing coal/oil/water fuels. 4,326,855, Cl. 44-51/.000.

Cotton, Donald J. Capillary liquid fuel nuclear reactor. 4,327,443, Cl. 376-359.000.

Cotton, Leonard: *See—*
Ball, William J.; Cotton, Leonard; and Stewart, David G., 4,327,190, Cl. 518-714.000.

Cottrell, Ian W.; Baird, John K.; and Shim, Jaewon L., to Merck & Co., Inc. Copolymers of N,N-dimethylacrylamide and acrylamide. 4,326,970, Cl. 252-8.55D.

Coulter Electronics, Inc.: *See—*
Bello, Ernesto; Kolber, Steven N.; and Coulter, Wallace H., 4,326,851, Cl. 23-230.00R.

Coulter, Wallace H.: *See—*
Bello, Ernesto; Kolber, Steven N.; and Coulter, Wallace H., 4,326,851, Cl. 23-230.00R.

Court, Patrick R. J., to TMX Systems Limited. Miniature transmitter and method for making same. 4,327,444, Cl. 455-100.000.

Courtaulds Limited: *See—*
Lowe, David R.; and Hay, Gerard J., 4,326,302, Cl. 2-405.000.

Cowsar, Donald R.: *See—*
Davis, Thomas A.; and Cowsar, Donald R., 4,327,046, Cl. 264-102.000.

Cox, Russell C., to Phillips Petroleum Company. Method of assembling a conduit joint. 4,326,327, Cl. 29-434.000.

Crawford, Patrick J. Mobile device for handling material. 4,326,571, Cl. 144-34.00E.

Craycraft, Mary: *See—*
Schultz, Kenneth E.; and Craycraft, Mary, 4,326,516, Cl. 128-214.00R.

Critikon, Inc.: *See—*
Vaillancourt, Vincent L., 4,326,569, Cl. 141-383.000.

Crook, Michael: *See—*
Gundersen, Ray S.; Colledge, Ronald J.; Jenkins, Roy H.; and Crook, Michael, 4,326,425, Cl. 73-863.530.

Crooks, Stephen J.; and Stevenson, Robert A., to General Electric Company Limited, The. Telephone system. 4,327,256, Cl. 179-99.00R.

Cropsey, Leo M., to Occidental Petroleum Corporation. Surgical procedure for embryo transplants on animals. 4,326,505, Cl. 128-1.00R.

Croslin, Michael E. Method and apparatus for performing non-invasive blood pressure and pulse rate measurements. 4,326,537, Cl. 128-687.000.

Cross, Carroll N. Display mount and method. 4,326,906, Cl. 156-201.000.

Crossley, Roger, to John Wyeth & Brother Limited. Certain 2-(phenyl sulfinylmethyl or ethyl) pyridine derivatives, composition containing same and method of using same. 4,327,102, Cl. 424-263.000.

Croyle, Ronald A. Fishing for cards game. 4,326,709, Cl. 273-1.0GC.

Crutchfield, Marvin M., to Monsanto Company. Reversible deflocculation of clay slurries. 4,327,189, Cl. 501-148.000.

Cull, Neville L.: *See—*
Sawyer, Willard H.; and Cull, Neville L., 4,326,947, Cl. 208-111.000.

Cummings, Frances M., to PPG Industries, Inc. Stabilization of methylchloroform. 4,326,924, Cl. 203-6.000.

Cummins Engine Company, Inc.: *See—*
Amrhein, Earl F., 4,326,484, Cl. 123-90.500.

Cuomo, Frank, Jr.: *See—*
Chambers, Robert W.; and Cuomo, Frank, Jr., 4,326,325, Cl. 29-27.00C.

Cusack, Lawrence B. Side loading vehicle. 4,326,830, Cl. 414-470.000.

Cwirzen, Casimir Z.: *See—*
Hines, William W.; and Cwirzen, Casimir Z., 4,327,393, Cl. 361-119.000.

Dahlberg, Kurt: *See—*
Blomqvist, Ake; and Dahlberg, Kurt, 4,326,340, Cl. 33-238.000.

Daido Tokushuko Kabushiki Kaisha: *See—*
Abeyama, Shozo; Saito, Makoto; Kimura, Atsuyoshi; and Nakamura, Sadayuki, 4,326,886, Cl. 75-129.000.

Daidotokushuko Kabushikikaisha: *See—*
Adachi, Toshio; and Hiratake, Susumu, 4,326,842, Cl. 425-10.000.

Daimler-Benz Aktiengesellschaft: *See—*
Siebels, Karl-Heinz, 4,326,865, Cl. 55-385.00B.

Dainippon Inc. & Chemicals, Inc.: *See—*
Mitani, Tomomasa; Ogasawara, Yoshimi; and Hiraishi, Shunichi, 4,327,145, Cl. 428-290.000.

Dainippon Screen Manufacturing Co., Ltd.: *See—*
Tanabe, Osamu, 4,327,167, Cl. 430-31.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Yamada, Mitsuhiko; and Nakade, Toshiaki, 4,327,380, Cl. 358-264.000.

Daiwa Can Company, Ltd.: *See—*
Inoue, Kenichi, 4,326,401, Cl. 72-350.000.

D'Alo, Herbert F.; and Muetterties, Andrew J., to Abbott Laboratories. Venipuncture device. 4,326,519, Cl. 128-214.400.

Daly, Edward: *See—*
Branovich, Louis E.; Daly, Edward; Newman, Albert F.; and Smith, Willis M., 4,327,131, Cl. 427-229.000.

Daly, Kevin R., to Raytheon Company. Method for laser soldering. 4,327,277, Cl. 219-121.0LD.

Dana Corporation: *See—*
Janson, Gunnar H., 4,327,301, Cl. 310-104.000.

Dapp, George P.; and Scott, Michael A., to Columbia Ribbon & Carbon Mfg. Co., Inc. Process for making transfer elements. 4,327,127, Cl. 427-146.000.

Darnell, William R.: *See—*
Jackson, Winston J., Jr.; and Darnell, William R., 4,327,206, Cl. 528-179.000.

Darr, Richard C.: *See—*
Nickel, Gerhard E. B.; and Darr, Richard C., 4,326,638, Cl. 215-12.00R.

Darrow, Berwin W.; and Wilkinson, David J., to International Business Machines Corporation. Lubrication control apparatus. 4,326,603, Cl. 184-6.100.

Das Gupta, Sankar; Jacobs, James K.; and Mohanta, Samaresh, to HSA Reactors Limited. Planar carbon fiber electrode structure. 4,326,938, Cl. 204-228.000.

Data General Corporation: *See—*
Frissell, John M.; and Swanson, Kris E., 4,327,408, Cl. 364-200.000.

Data Instruments, Inc.: *See—*
Erichsen, Herman W., 4,327,350, Cl. 338-4.000.

Daughtry, Georgia A. Greeting card display device. 4,326,349, Cl. 40-152.100.

Dauterman, William H.: *See—*
Facha, Joseph V.; Cook, John P.; and Dauterman, William H., 4,326,920, Cl. 376-205.000.

Dauvergne, Jean L. R., to Societe Anonyme Francaise du Ferodo. Hydraulic control device for a motor vehicle braking circuit. 4,326,379, Cl. 60-550.000.

Davidas, Jean P. Method for making artifacts usable in vivo and a artifacts made by said method. 4,326,305, Cl. 3-1.900.

Davidson, James D. Shutter shields (R) vertical travel et al. 4,326,360, Cl. 49-63.000.

Davies, Ronald C., to Gaea Trade and Development Company Limited. Coin detecting apparatus for distinguishing genuine coins from slugs, spurious coins and the like. 4,326,621, Cl. 194-100.00A.

Davis, Brian C.; and Bryer, Robert P., to Suntech, Inc. PVC Plasticized with dicyclohexylbiphenyl and primary plasticizer. 4,327,021, Cl. 524-297.000.

Davis, Jesse B. Transfer apparatus and method. 4,326,910, Cl. 156-540.000.

Davis, Philip S.: *See—*
Jones, Robert L.; Volgenau, Lewis; and Davis, Philip S., 4,326,962, Cl. 210-698.000.

Davis, Thomas A.; and Cowsar, Donald R., to Southern Research Institute. Method for producing a rigid, shaped mass support system. 4,327,046, Cl. 264-102.000.

Davydov, Vadim A.; Khromov, Vladimir I.; Makeev, Igor M.; Kogos, Aizik M.; and Rymarenko, Leonid I. Non-slip multi-pass wire mill. 4,326,400, Cl. 72-280.000.

Day, Roger W.; Dunavent, Sidney W.; and Rich, Elvis, to Geosource Inc. Centrifugal degasser. 4,326,863, Cl. 55-171.000.

Dayco Corporation: *See—*
Dolan, John J.; and Roocroft, Syd, 4,327,044, Cl. 264-36.000.

Dean, Arthur P.: *See—*
Burke, Leonard F.; and Dean, Arthur P., 4,326,463, Cl. 102-513.000.

Deane, Clifford T., to Electro-Kinetics, Inc. Energy conserving drive system. 4,327,295, Cl. 290-40.00C.

DeBruin, Henderikus J.; and Badwal, Sukhvinder P. S., to Flinders University of South Australia, The. Electrode-active oxygen monitor. 4,326,318, Cl. 23-232.00E.

Deckarm, Gunter: *See—*
Murzin, Horst; Woss, Rainer; Burghoff, Hans; Schmieder, Frank; Herzig, Alfred; Junge, Johannes; and Deckarm, Gunter, 4,326,625, Cl. 198-653.000.

Dedoes Industries, Inc.: *See—*
Dedoes, Jerry A., 4,326,591, Cl. 172-22.000.

Dedoes, Jerry A., to Dedoes Industries, Inc. Soil coring implement. 4,326,591, Cl. 172-22.000.

Deere & Company: *See—*
Gage, Douglas M., 4,326,558, Cl. 137-554.000.
Oka, Ken K.; and Haag, Peter C., 4,326,594, Cl. 172-328.000.
Schillerstrom, Merl S.; and Tufts, Robert A., 4,326,369, Cl. 56-41.000.

Degawa, Takashi: *See—*
Kawashima, Kenichi; Horibe, Kiyoshi; and Degawa, Takashi, 4,326,838, Cl. 417-269.000.

Deichert, William G.; Friends, Gary D.; Melpolder, John B.; and Park, Joon S., to Bausch & Lomb Incorporated. Polysiloxane with cycloalkyl modifier composition and biomedical devices. 4,327,203, Cl. 526-279.000.

Deigner, Paul: *See—*
Schaefer, Dieter; Motz, Herbert; Mayer, Dieter; Deigner, Paul; Hack, Joachim; and Falk, Roland, 4,327,139, Cl. 428-65.000.

Dejneka, Tamara: *See—*
Sundeen, Joseph E.; and Dejneka, Tamara, 4,327,111, Cl. 424-278.000.

de Jongh, Rudolph O.: *See—*
Froling, Albert; de Jongh, Rudolph O.; and Kemps, Josephus M. A., 4,326,932, Cl. 204-59.00R.

Demers, Robert R., to RCA Corporation. Wafer and boule protection during the blade return stroke of a wafer saw. 4,326,494, Cl. 125-12.000.

DeMoss, Dean; Biessum, Norman S.; Gyi, Ko Ko; and Ragle, Herbert U., to Burroughs Corporation. Pneumatic commutator for end-wise partitioning. 4,327,386, Cl. 360-99.000.

Dennison, Allan G.: *See—*
Smith, Stanley B., Jr.; Schleicher, Robert G.; and Dennison, Allan G., 4,326,802, Cl. 356-316.000.

Dennison Manufacturing Company: *See—*
Thurlow, John F., 4,327,128, Cl. 427-153.000.

Dent, Thomas H.: *See—*
Smith, Edward H.; Dent, Thomas H.; and Marchese, Robert T., 4,326,317, Cl. 15-302.000.

Dental Chemical Co., Ltd.: *See—*
Aoki, Hideki, 4,327,079, Cl. 424-57.000.

Derewonko, Henri: *See—*
LePage, Joel; Laviron, Michel; and Derewonko, Henri, 4,326,330, Cl. 29-571.000.

De Ronde, Frans C., to U.S. Philips Corporation. Bandstop filter for very high frequency transmission lines and biassing circuit for a very high frequency transistor comprising this filter. 4,327,342, Cl. 333-204.000.

DeRosa, Fasquale A. Electric enclosure locking assembly. 4,326,395, Cl. 70-168.000.

Derossi, Piero M. System for transmitting heading information from a compass to several followers. 4,327,363, Cl. 340-870.340.

DesMarais, Raymond C., Jr. Method for manufacturing printed circuits comprising printing conductive ink on dielectric surface. 4,327,124, Cl. 427-96.000.

Despiney, Philippe, to Enertec. Capacitive voltage transformers with electronic output. 4,327,390, Cl. 361-16.000.

Destree, Allen. Tool stand. 4,326,694, Cl. 248-676.000.

Detroit Stoker Company: *See—*
Reschly, David C., 4,326,469, Cl. 110-115.000.

Deutsch, Hans; and Heger, Norbert, to Waagner-Biro Aktiengesellschaft. Apparatus for sealing the periphery of an opening. 4,326,556, Cl. 137-240.000.

Deutsch, Leslie J.: *See—*
Deutsch, Ralph; and Deutsch, Leslie J., 4,327,419, Cl. 364-717.000.

Deutsch, Ralph; and Deutsch, Leslie J., to Kawai Musical Instrument Mfg. Co., Ltd. Digital noise generator for electronic musical instruments. 4,327,419, Cl. 364-717.000.

Deutsche Calypsolgesellschaft mbH & Co.: *See—*
Kieber, Lothar, 4,326,648, Cl. 222-162.000.

Diachem, Inc.: *See—*
Babb, Albert L.; and Scribner, Belding H., 4,326,955, Cl. 210-638.000.

Dickens, James. Target for tossed marbles. 4,326,722, Cl. 273-400.000.

Diederen, Willi: *See—*
Austel, Volkhard; Reiffen, Manfred; Heider, Joachim; and Diederen, Willi, 4,327,100, Cl. 424-256.000.

Diel, Hartmut: *See—*
Zacharias, Theodor; and Diel, Hartmut, 4,326,623, Cl. 198-345.000.

Dieterich, Charles B.; and Lang, Frank B., to RCA Corporation. Video disc player with variable offset RFI reduction circuit. 4,327,431, Cl. 369-126.000.

Dietz, Richard E.: *See—*
Welch, Melvin B.; Dietz, Richard E.; and Capshew, Charles E., 4,326,988, Cl. 252-429.00B.

Diffracto Ltd.: *See—*
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; Clarke, Donald A.; and Richards, Blaine, 4,326,808, Cl. 356-445.000.

Digital Equipment Corporation: *See—*
Lomicka, Roy F., Jr.; and Heller, Peter N., 4,326,813, Cl. 400-124.000.

Di Giulio, Adolph V.; and Bauer, Jack N., to Atlantic Richfield Company. Fire-retardant anhydride copolymers. 4,327,197, Cl. 521-147.000.

Dillon, Kenneth R.; and Gardner, Richard N., to Minnesota Mining and Manufacturing Company. Infiltrated powdered metal composite article. 4,327,156, Cl. 428-568.000.

Director-General of Agency of Industrial Science and Technology: *See—*
Kato, Tsutomu; and Kaiho, Mamoru, 4,326,857, Cl. 48-210.000.

Di Vita, Sam: *See—*
Arpin, John B.; and Di Vita, Sam, 4,326,657, Cl. 226-97.000.

Dr. Ing. h.c.F. Porsche AG: *See—*
Kroniger, Wilhelm, 4,326,734, Cl. 280-724.000.

Dr.-Ing. Ludwig Pietzsch: *See—*
Kauer, Harald; Overlach, Knud; and Wilken, Joachim, 4,326,447, Cl. 89-41.00H.

Doddi, Namassivaya: *See—*
Guerrero, Jorge; Mellon, Alice D.; Fritz, Charles G.; and Doddi, Namassivaya, 4,326,522, Cl. 128-/260.000.

Dofasco Inc.: *See—*
McAllister, John H.; Stewart, Lindsay G.; Gladysz, Carl V.; and Wilson, Jim, 4,326,887, Cl. 75-257.000.

Doktorov, Leonid B.: *See—*
Beznosjuk, Evgeny I.; Doktorov, Leonid B.; Musyakin, Vyacheslav E.; and Kolomeets, Sergei V., 4,326,823, Cl. 407-51.000.

Dolan, John J.; and Roocroft, Syd, to Dayco Corporation. Method of improving outer portion of a textile fiber processing component. 4,327,044, Cl. 264-36.000.

Dolenti, Alfred N. Hot stick rotary brush for cleaning aerial conductors. 4,326,316, Cl. 15-246.000.

Dollard, Walter J.: *See—*
Ferrari, Harry M.; and Dollard, Walter J., 4,326,922, Cl. 376-435.000.

Donaldson, Jack J.: *See—*
Benoit, Gordon L.; Bustin, Franz; and Donaldson, Jack J., 4,326,664, Cl. 229-54.00R.

Donnelly, Harold F.: *See—*
Ryan, Lenore S.; Murray, Frank C.; Sprangers, Ann M.; Santoski, William J.; Sciaraffa, Michael A.; Abel, Kent W.; and Donnelly, Harold F., 4,326,528, Cl. 128-287.000.

Donner, Gary L., to Texaco Inc. Copper liquor analyzer. 4,326,806, Cl. 356-410.000.

Dorrance, William H., to Organization Control Services, Inc. Method for producing hydrocarbons and oxygen from carbon dioxide and water. 4,327,239, Cl. 585-733.000.

Dorsey, Glenn F.; and Hassall, James C., II, to Litton Systems, Inc. Rotary coaxial assembly. 4,326,769, Cl. 339-177.00E.

Doss, James D.; and Hutson, Richard L., to United States of America, Energy. Corneal-shaping electrode. 4,326,529, Cl. 128-303.100.

Dostert, Klaus: *See—*
Baier, Paul W.; Dostert, Klaus; Pandit, Madhukar; and Simons, Reinhard, 4,327,438, Cl. 375-1.000.

Doudet, Michel, to SECIM. Extrusion press operating by the indirect method. 4,326,399, Cl. 72-263.000.

Dow Chemical Company, The: *See—*
Allen, James A.; Knight, George W.; and Edmondson, Morris S., 4,327,009, Cl. 524-114.000.
Lee, John M.; and Bauman, William C., 4,326,961, Cl. 210-683.000.
Orvik, Jon A., 4,327,220, Cl. 546-345.000.
Pryor, Alvetta; and Ishibe, Nobuyuki, 4,327,232, Cl. 570-108.000.
Watson, John D., Sr.; and Bauman, William C., 4,326,963, Cl. 210-792.000.

Dowbenko, Rostyslaw: *See—*
Schimme, Karl F.; Seiner, Jerome A.; Christenson, Roger M.; and Dowbenko, Rostyslaw, 4,327,008, Cl. 524-104.000.

Dragerwerk AG: *See—*
Schulz, Volker; Kunke, Stefan; and Heim, Ulrich, 4,326,513, Cl. 128-203.140.

Drake, James F., Jr.; and Rambosek, G. Phillip, to Minnesota Mining and Manufacturing Company. Solid dose ballistic projectile. 4,326,524, Cl. 128-260.000.

Dressler, Roger W., to Motorola, Inc. Noise blanker which tracks average noise level. 4,327,446, Cl. 455-223.000.

Dromard, Adrien; and Ramanadin, to Rhone-Poulenc Industries. Preparation of anion exchange resins by bromination of vinyl aromatic polymers. 4,327,191, Cl. 521-31.000.

Droop, Firma: *See—*
Lasermann, Franz; and Wittenbreder, Eduard, 4,326,824, Cl. 409-132.000.
Drudy, William A., to R.F.I. Inc. Apparatus for injecting fluids into aggregates. 4,326,560, Cl. 137-897.000.
Druschke, Frank; Margotte, Dieter; Cohnen, Wolfgang; and Idel, Karsten, to Bayer Aktiengesellschaft. Flame resistant, transparent polycarbonates comprising bisulfite adducts. 4,327,015, Cl. 524-162.000.
Drzewiecki, Tadeusz M., to United States of America, Army. Fluidic force transducer. 4,326,559, Cl. 137-804.000.
D'Silva, Themistocles D. J., to Union Carbide Corporation. Pesticidal symmetrical N-substituted bis-carbamoyloximino disulfide compounds. 4,327,110, Cl. 424-277.000.
DuBord, Edward W.: *See—*
Capuano, Italo A.; Turley, Patricia A.; and DuBord, Edward W., 4,326,850, Cl. 23-230.00R.
Dugan, William P., to General Dynamics, Pomona Division. Method of electroforming. 4,326,928, Cl. 204-9.000.
Dummer, Gerhard: *See—*
Kratel, Gunter; Dummer, Gerhard; Niessner, Peter; Grune, Burkhard; and Stohr, Gunter, 4,326,852, Cl. 23-293.00R.
Dunavent, Sidney W.: *See—*
Day, Roger W.; Dunavent, Sidney W.; and Rich, Elvis, 4,326,863, Cl. 55-171.000.
Dunchock, Richard S., to SL Container Corporation. Storage rack. 4,326,726, Cl. 280-79.10A.
Dunlap, Albert R., to Brown Wooten Mills, Inc. Decorative footlet-type sock. 4,326,393, Cl. 66-172.00E.
Dunn, Kenneth F.: *See—*
Geier, Leonard W.; and Dunn, Kenneth F., 4,326,503, Cl. 126-443.000.
Du Pont de Nemours, E. I., and Company: *See—*
Marsh, Frank D., 4,327,036, Cl. 260-465.00G.
Dupont, Georges: *See—*
Autage, Roger; and Dupont, Georges, 4,326,697, Cl. 251-174.000.
Dynamit Nobel AG: *See—*
Ackermann, Otto; Leuck, Hans; Meyer, Gunther; and Schmeling, Gerhard, 4,327,230, Cl. 568-851.000.
E. J. Brooks Company: *See—*
Guiler, Richard S., 4,326,740, Cl. 292-307.00B.
E. R. Squibb & Sons, Inc.: *See—*
Sundeen, Joseph E.; and Dejneka, Tamara, 4,327,111, Cl. 424-278.000.
Wong, Thomas M.; and Patel, Mahendra R., 4,327,080, Cl. 424-80.000.
Easley, Mark R.: *See—*
Patel, Rameshchandra S.; and Easley, Mark R., 4,327,410, Cl. 364-200.000.
Eastman, Alan D., to Phillips Petroleum Company. Dehydrogenation of organic compounds with a promoted zinc titanate catalyst. 4,327,238, Cl. 585-661.000.
Eastman Kodak Company: *See—*
Clark, Suzanne P.; Reynolds, George A.; and Perlstein, Jerome H., 4,327,169, Cl. 430-75.000.
Jackson, Winston J., Jr.; and Darnell, William R., 4,327,206, Cl. 528-179.000.
Weemes, Doyle A.; and Seymour, Robert W., 4,327,198, Cl. 525-63.000.
Eaton Corporation: *See—*
Campbell, Larry J., 4,327,248, Cl. 174-107.000.
Eberhardt, Hans: *See—*
Brickl, Rolf; and Eberhardt, Hans, 4,327,114, Cl. 424-331.000.
Ebisu, Osamu: *See—*
Yagitani, Takayuki; and Ebisu, Osamu, 4,327,395, Cl. 361-326.000.
Ebo-Jager, Inc.: *See—*
Jager, Wolfgang; and Boettger, Erhard, 4,327,281, Cl. 219-523.000.
Eckart, Joseph E.: *See—*
Frost, Bob L.; Leeds, Harry D.; and Eckart, Joseph E., 4,326,439, Cl. 83-27.000.
Eckels, John F., to Heyman, Arnold M. Blood sample taking device. 4,326,541, Cl. 128-766.000.
Eckert, Rene A.; and Schmuck, Guenter E., to National Starch and Chemical Corporation. Heat collapsing foam system. 4,326,904, Cl. 156-85.000.
Eckland, John E. Solar canal. 4,326,498, Cl. 126-415.000.
Eckles, William E.; Bishop, Craig V.; and Vaitekunas, Peter T., to ROHCO Incorporated. Automatic analyzer and control system for electroplating baths. 4,326,940, Cl. 204-232.000.
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Edgren, David: *See—*
Swanson, David; and Edgren, David, 4,326,525, Cl. 128-260.000.
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Edmondson, Morris S.: *See—*
Allen, James A.; Knight, George W.; and Edmondson, Morris S., 4,327,009, Cl. 524-114.000.
Edmondson, Ronald, to Plastiers Limited. Method of molding gutter fittings. 4,327,051, Cl. 264-318.000.
Edson, Alvin W.; and Windyka, Richard A., to Singer Company, The. Method and apparatus calibrating a plurality of preamplifiers. 4,327,371, Cl. 358-10.000.
Effler, Timothy A.: *See—*
Tran, Luan G.; Effler, Timothy A.; and Wat, Karen K., 4,326,719, Cl. 273-238.000.
Egan, Herbert W., Jr.: *See—*
George, Larry T.; and Egan, Herbert W., Jr., 4,326,848, Cl. 474-135.000.
Ehresmann, Ewald, to Combustion Research, Inc. Fuel preheater for internal combustion engines. 4,326,490, Cl. 123-557.000.
Eian, Gilbert L., to Minnesota Mining and Manufacturing Company. Cartridge respirator with service life indicator. 4,326,514, Cl. 128-202.220.
EIC Laboratories, Inc.: *See—*
Holleck, Gerhard L., 4,327,158, Cl. 429-101.000.
Eilerman, Robert G.: *See—*
Willis, Brian J.; and Eilerman, Robert G., 4,326,996, Cl. 252-522.00R.
Willis, Brian J.; Eilerman, Robert G.; and Yurecko, John M., Jr., 4,326,997, Cl. 252-522.00R.
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Tanaka, Satoru; Shimada, Katsutoshi; Hashimoto, Kazunori; Ema, Kiichi; and Ueda, Koichiro, 4,327,217, Cl. 546-281.000.
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Facha, Joseph V.; Cook, John P.; and Dauterman, William H., 4,326,920, Cl. 376-205.000.
Lapides, Melvin E., 4,326,918, Cl. 376-272.000.
Temple, Victor A. K., 4,327,367, Cl. 357-38.000.
Electro Audio Dynamics Inc.: *See—*
von Recklinghausen, Daniel R., 4,327,250, Cl. 179-1.00F.
Electro-Kinetics, Inc.: *See—*
Deane, Clifford T., 4,327,295, Cl. 290-40.00C.
Ellzey, Floyd P. Cooperative escalator and wheel chair. 4,326,622, Cl. 198-322.000.
Eltec Instruments, Inc.: *See—*
Oettel, Friedrich H., 4,326,663, Cl. 228-123.000.
Eltra Corporation: *See—*
Bonsall, Samuel B., 4,327,185, Cl. 501-89.000.
Ema, Kiichi: *See—*
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Emery Industries, Inc.: *See—*
McVay, Kenneth R.; Lakes, Stephen C.; and Zilch, Karl T., 4,327,030, Cl. 260-407.000.
Emhart Industries, Inc.: *See—*
Schuder, Maurice E.; and Stafford, Richard W., 4,327,259, Cl. 200-38.00A.
Emrich, Robert K., to ESCO Corporation. Excavating tooth assembly. 4,326,348, Cl. 37-142.00R.
Ems Industrie: *See—*
Harmant, Michel, 4,326,440, Cl. 83-482.000.
Endo, Shigeru: *See—*
Sawa, Yuji; Endo, Shigeru; and Uehara, Tsutomu, 4,327,137, Cl. 428-35.000.
Endo, Yasuhiko; Mimori, Takashi; and Goto, Motohiro, to Asahi Glass Company, Ltd. Multicellular monolithic ceramic body and preparation thereof. 4,327,188, Cl. 501-134.000.
Ener-Tec, Inc.: *See—*
Shroyer, Larry L., 4,326,954, Cl. 210-222.000.
Enertec: *See—*
Despiney, Philippe, 4,327,390, Cl. 361-16.000.
Souillard, Michel, 4,327,392, Cl. 361-80.000.
Engel, Werner: *See—*
Bornefeld, Horst; Fort, Hans P.; and Engel, Werner, 4,326,907, Cl. 156-212.000.
Engle, Carl E.; and Moldenhauer, Donald, to Hydro AG-Tech, Inc., a part interest. Honey pit fertilization system. 4,326,675, Cl. 241-236.000.
Enomoto, Ryo: *See—*
Kato, Kunio; Sugiyama, Yoshiki; and Enomoto, Ryo, 4,327,067, Cl. 423-345.000.
Enomoto, Tadao; and Koide, Hiroshi, to Citizen Watch Company Limited. Decorative plate for a timepiece. 4,327,428, Cl. 368-232.000.
Erichsen, Herman W., to Data Instruments, Inc. Pressure transducer. 4,327,350, Cl. 338-4.000.
Erickson, Erick E.: *See—*
Breslow, Jeffrey D.; and Erickson, Erick E., 4,326,710, Cl. 273-1.00E.
Erlich, David. Chess pieces with detachable markers. 4,326,720, Cl. 273-239.000.
Ernst, Larry M.: *See—*
Champion, James R.; Ernst, Larry M.; Ford, Leland W.; and Velarde, Ronald G., 4,326,796, Cl. 355-14.0CH.
Ernst, Richard R.; and Aue, Walter P., to Spectrospin AG. Method for the recording of spin resonance spectra and an apparatus for the implementation of such method. 4,327,425, Cl. 365-152.000.
Ernyei, Herbert, to Lignes Telegraphiques et Telephoniques. Electromechanical filter cells. 4,327,341, Cl. 333-197.000.
ESAB Aktiebolag: *See—*
Lundin, Borje R., 4,327,270, Cl. 219-73.200.
ESCO Corporation: *See—*
Emrich, Robert K., 4,326,348, Cl. 37-142.00R.
Eshoo, Fredrick. Non-rigid airship. 4,326,681, Cl. 244-30.000.

Ettinger, Robert H.; and Pasko, Walter J., to General Electric Company. Transformer core having charge dissipation facility. 4,327,349, Cl. 336-219.000.

Evans, John M.; and Markwell, Roger E., to Beecham Group Limited. Pyrano derivatives, a process for their preparation and their use. 4,327,099, Cl. 424-256.000.

Ewertowski, Norbert; and Janser, Herbert, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Pallet feeder. 4,326,624, Cl. 198-370.000.

Exxon Research & Engineering Co.: *See*—
Canevari, Gerard P., 4,326,986, Cl. 252-384.000.
Kwon, Yiduk; and Lawson, Paul, 4,327,318, Cl. 320-39.000.
Luckenbach, Edward C.; and Worley, Arthur C., 4,327,055, Cl. 422-110.000.
Sawyer, Willard H.; and Cull, Neville L., 4,326,947, Cl. 208-111.000.
Schlosberg, Richard H., 4,326,949, Cl. 208-263.000.

Facet Enterprises, Inc.: *See*—
Mortensen, Harold R., 4,326,429, Cl. 74-7.00R.

Facha, Joseph V.; Cook, John P.; and Dauterman, William H., to Electric Power Research Institute, Inc. Nuclear reactor including a reactor vessel and technique for supporting the latter. 4,326,920, Cl. 376-205.000.

Falk, Richard A. Molded sand insulated sampler. 4,326,426, Cl. 73-864.590.

Falk, Roland: *See*—
Schaefer, Dieter; Motz, Herbert; Mayer, Dieter; Deigner, Paul; Hack, Joachim; and Falk, Roland, 4,327,139, Cl. 428-65.000.

Farge, Daniel; Leger, Andre; and Ponsinet, Gerard, to Rhone-Poulenc Industries. Methoxy derivatives of 1,4-dithiepino-[2,3-c]-pyrrole. 4,327,095, Cl. 424-250.000.

Farian, Gerhard: *See*—
Maurer, Werner; and Farian, Gerhard, 4,326,661, Cl. 227-120.000.

Farmitalia Carlo Erba S.p.A.: *See*—
Bernardi, Luigi; Masi, Paolo; Suarato, Antonino; and Arcamone, Federico, 4,327,029, Cl. 260-351.100.
Marsili, Leonardo; Franceschi, Giovanni; and Sanfilippo, Aurora, 4,327,096, Cl. 424-250.000.

Farshatov, Marat N.: *See*—
Bukhtiyarov, Ivan D.; An, Viktor B.; Farshatov, Marat N.; Sapozhnikov, Fedor F.; Sidorov, Anatoly G.; Proskurina, Natalya A.; and Marakin, Vladimir I., 4,326,410, Cl. 73-117.300.

Fatzer, Willy: *See*—
Lohse, Friedrich; Schmid, Rolf; and Fatzer, Willy, 4,327,032, Cl. 260-448.00R.

Faulkner, Keith; and Appleford, David E. Weighing and dispensing unit. 4,326,645, Cl. 222-1.000.

Feger, Rolf: *See*—
Botz, Jakob; Feger, Rolf; Mutschler, Erich; Spazierer, Hubert; and Weber, Adam, 4,327,264, Cl. 200-295.000.

Feinberg, Stewart C.; Lundsager, Christian B.; Lundquist, Joseph T., Jr.; and Balouskus, Robert A., to W. R. Grace & Co. Battery separator. 4,327,164, Cl. 429-144.000.

Feldman, Daniel W., to Standard Oil Company, The. High nitrile copolymer resins containing epoxidized oil for improved impact resistance. 4,327,002, Cl. 524-114.000.

Feldman, Martin; White, Alan D.; and White, Donald L., to Bell Telephone Laboratories, Incorporated. Method and apparatus for aligning mask and wafer members. 4,326,805, Cl. 356-399.000.

Feldstein, Nathan. Colloidal compositions for electroless deposition comprising colloidal copper-stannic oxide product. 4,327,125, Cl. 427-97.000.

Felix, Cristian J.; and Genaro, Donald M., to PepsiCo Inc. Security pylon for a vending machine. 4,326,620, Cl. 194-1.00A.

Feng, Chin-Liang: *See*—
Hwang, Top-Ping; and Feng, Chin-Liang, 4,327,308, Cl. 315-99.000.

Fenn, George S. Playback system for recording disk having flexible, deformable recording membrane. 4,327,435, Cl. 369-261.000.

Fenske, Steven L.: *See*—
Fieldhouse, John W.; and Fenske, Steven L., 4,327,064, Cl. 423-300.000.

Ferrara, Louis T. Blood separator and dispenser. 4,326,959, Cl. 210-515.000.

Ferrari, Harry M.; and Dollard, Walter J., to Westinghouse Electric Corp. Composite nuclear fuel assembly. 4,326,922, Cl. 376-435.000.

Ferrini, Pier G.: *See*—
Sele, Alex; Ferrini, Pier G.; Haas, Georges; Jaeggi, Knut A.; and Rossi, Alberto, 4,327,091, Cl. 424-246.000.

Ferro Manufacturing Corporation: *See*—
Pickles, Joseph; and Fudala, Chester S., 4,326,690, Cl. 248-396.000.

Fertell, Paul A.: *See*—
Cioca, Gheorghe; and Fertell, Paul A., 4,327,195, Cl. 521-102.000.

Feuerstein, Diane: *See*—
Snyder, William R.; and Feuerstein, Diane, 4,326,980, Cl. 252-180.000.

Feyen, Peter: *See*—
Arend, Gunter; and Feyen, Peter, 4,327,040, Cl. 260-973.000.

Fiat Auto S.p.A.: *See*—
Cerruti, Eraldo, 4,327,352, Cl. 340-52.00F.

Fieldhouse, John W.; and Graves, Daniel F., to Firestone Tire & Rubber Company, The. Method of purifying cyclic dichlorophosphazenes containing trace amounts of protic impurities. 4,327,063, Cl. 423-300.000.

Fieldhouse, John W.; and Fenske, Steven L., to Firestone Tire & Rubber Company, The. Solution polymerization of cyclic dichlorophosphazene oligomers in cycloaliphatic solvents. 4,327,064, Cl. 423-300.000.

Filosa, Albert V.: *See*—
Bostwick, Lewis S.; Filosa, Albert V.; and LaTorre, Richard R., 4,326,428, Cl. 74-5.00F.

Finishing Equipment, Inc.: *See*—
Sabatka, Winston E.; and Bloomquist, Wilburn M., 4,326,933, Cl. 204-129.600.

Fink, Hans-Ferdi; and Freiberger, Rolf, to Th. Goldschmidt AG. Lubricant and release agent for molded rubber articles. 4,326,999, Cl. 524-261.000.

Finnegan, Robert J., to Barreca Products Co., Inc. Ski carrier. 4,326,747, Cl. 294-147.000.

Fip, S.A. de C.V.: *See*—
Constantino, Daniel G., 4,326,698, Cl. 251-327.000.

Firestone Tire & Rubber Company, The: *See*—
Fieldhouse, John W.; and Graves, Daniel F., 4,327,063, Cl. 423-300.000.
Fieldhouse, John W.; and Fenske, Steven L., 4,327,064, Cl. 423-300.000.
Hausch, Walter R., 4,327,138, Cl. 428-36.000.

Fischer, Fred W. Indexable cutting tool. 4,326,437, Cl. 82-36.00A.

Fischer, Robert B.: *See*—
Larson, John A.; and Fischer, Robert B., 4,326,885, Cl. 75-125.000.

Fischli, Albert E.: *See*—
Branca, Quirico; Fischli, Albert E.; and Szente, Andre', 4,327,026, Cl. 260-239.30D.

Fitness Concepts, Inc.: *See*—
Guthrie, Phillip K.; and Pillow, Richard W., 4,326,706, Cl. 272-119.000.

Fitton, David L., to United Technologies Corporation. Shroud for a rotor blade. 4,326,836, Cl. 416-196.00R.

Fitts, John M., to Hughes Aircraft Company. Laser beam wavefront and line-of-sight error correction system. 4,326,800, Cl. 356-152.000.

Flagg, John F.; Johnson, Russell W.; and Gatsis, John G., to UOP Inc. Coal liquefaction process. 4,326,945, Cl. 208-8.0LE.

Flaig, Heinrich; and Wolf, Karl, to J. M. Voith, GmbH. Breast box nozzle for a paper machine. 4,326,916, Cl. 162-344.000.

Flaum, Dennis M. Bedding device. 4,326,309, Cl. 5-12.00R.

Fleury, George J., Jr. Surgical snare. 4,326,530, Cl. 128-303.140.

Flinders University of South Australia, The: *See*—
DeBruin, Henderikus J.; and Badwal, Sukhvinder P. S., 4,326,318, Cl. 23-232.00E.

FMC Corporation: *See*—
Gerow, Gordon P., 4,326,926, Cl. 203-91.000.

Foam Design, Incorporated: *See*—
Gradek, Walter A.; and Boggs, John W., 4,326,655, Cl. 224-324.000.

Foley, William M., Jr., to McCarry, John D. Styrene copolymer for contact lenses. 4,327,202, Cl. 526-245.000.

Fomenko, Joseph; Kuecken, John A.; and Sloboda, James J., to Radionics Inc. Automatic telephone directory message system. 4,327,251, Cl. 179-1.0SM.

Ford, Leland W.: *See*—
Champion, James R.; Ernst, Larry M.; Ford, Leland W.; and Velarde, Ronald G., 4,326,796, Cl. 355-14.0CH.

Ford Motor Company: *See*—
Heitert, John S., 4,326,489, Cl. 123-520.000.

Forgac, John M.: *See*—
Meyer, James S.; Robinson, Ken K.; Forgac, John M.; and Tatterson, David F., 4,326,944, Cl. 208-8.00R.

Forrest, Sid. Automobile tow wheel attachment. 4,326,465, Cl. 104-165.000.

Fort, Hans P.: *See*—
Bornefeld, Horst; Fort, Hans P.; and Engel, Werner, 4,326,907, Cl. 156-212.000.

Fortenberry, Charles K. Knife sheath structure. 4,326,652, Cl. 224-232.000.

Fortlage, Paul R.: *See*—
LaBoda, John A.; and Fortlage, Paul R., 4,326,453, Cl. 98-87.000.

Foster, George W.: *See*—
Gilson, Robert E.; Foster, George W.; and Bonneyrat, Alain M., 4,326,837, Cl. 417-12.000.

Franceschi, Giovanni: *See*—
Marsili, Leonardo; Franceschi, Giovanni; and Sanfilippo, Aurora, 4,327,096, Cl. 424-250.000.

Frank, William E., to Westinghouse Electric Corp. Current control system for an induction heating apparatus. 4,327,268, Cl. 219-10.770.

Frankenberg, Carl R., to American Foam Latex Corporation. Mattress pad. 4,326,310, Cl. 5-448.000.

Fredberg, Jeffrey J., to Cambridge Collaborative, Inc. Acoustic pulse response measuring. 4,326,416, Cl. 73-597.000.

Freeman, Richard R.: *See*—
Ashkin, Arthur; Bjorkholm, John E.; Freeman, Richard R.; and Pearson, David B., 4,327,288, Cl. 250-251.000.

Freiberger, Rolf: *See*—
Fink, Hans-Ferdi; and Freiberger, Rolf, 4,326,999, Cl. 524-261.000.

Frequency, Technology, Inc.: *See*—
Wroblewski, Theodore, 4,327,311, Cl. 315-244.000.

Fretz, George C., III, to Goodyear Aerospace Corporation. Deceleration control circuit. 4,326,755, Cl. 303-96.000.

Frew, Jeremy G. M. Anti-rust composition. 4,326,888, Cl. 106-14.140.

Frey, Dieter. Motor vehicle roof carrier for the affixation of skis and other objects to be transported. 4,326,654, Cl. 224-315.000.

Fridley, Robert B.; and Moser, Raymond L., to Weyerhaeuser Company. Tree plantation selective falling and stocking control device. 4,326,570, Cl. 144-34.00R.

Friedberg, Martin F. Slide fastener with improved end connections. 4,326,319, Cl. 24-205.11R.
Friedman, Donald E., to Hussmann Refrigerator Co. Fluidic time delay system. 4,326,387, Cl. 62-184.000.
Friedrich Kocks GmbH & Company: *See*—
Zacharias, Theodor; and Diel, Hartmut, 4,326,623, Cl. 198-345.000.
Friends, Gary D.: *See*—
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Frisch, Kurt C., Jr.: *See*—
Kennedy, Joseph P.; and Frisch, Kurt C., Jr., 4,327,201, Cl. 526-131.000.
Frissell, John M.; and Swanson, Kris E., to Data General Corporation. Controller device with diagnostic capability for use in interfacing a central processing unit with a peripheral storage device. 4,327,408, Cl. 364-200.000.
Fritz, Adolf: *See*—
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Fritz, Charles G.: *See*—
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Fritzsche Dodge & Olcott Inc.: *See*—
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Willis, Brian J.; Eilerman, Robert G.; and Yurecko, John M., Jr., 4,326,997, Cl. 252-522.00R.
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Timmler, Helmut; Buchel, Karl; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,327,104, Cl. 424-269.000.
Froling, Albert; de Jongh, Rudolph O.; and Kemps, Josephus M. A., to Lever Brothers Company. Hydrogenation. 4,326,932, Cl. 204-59.00R.
Frost, Bob L.; Leeds, Harry D.; and Eckart, Joseph E., to Clarksville Machine Works, Inc. Apparatus and method for stacking and facing uncured brick. 4,326,439, Cl. 83-27.000.
Frost, Edmund C. Frozen dessert maker. 4,326,389, Cl. 62-342.000.
Fry, Emanuel D.; and Siewert, Herbert G., to Tecumseh Products Company. Cylinder unloading mechanism for refrigeration compressor. 4,326,839, Cl. 417-295.000.
Frye Electronics, Inc.: *See*—
Frye, George J., 4,327,326, Cl. 324-158.00R.
Frye, George J., to Frye Electronics, Inc. Automatic testing system for electric nerve stimulator units. 4,327,326, Cl. 324-158.00R.
Fuchigami, Mitsuru: *See*—
Toyama, Kohji; Fuchigami, Mitsuru; Nagayasu, Isao; and Tsukahara, Hirokazu, 4,327,148, Cl. 428-320.800.
Fuchs, Rainer: *See*—
Jautelat, Manfred; Arlt, Dieter; Lantzsch, Reinhard; Fuchs, Rainer; Riebel, Hans-Jochem; Schroder, Rolf; and Harnisch, Horst, 4,327,025, Cl. 260-338.000.
Fudala, Chester S.: *See*—
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Fuji Kiko Kaoushiki Kaisha: *See*—
Mochida, Haruo; and Kawashima, Hatsuo, 4,326,616, Cl. 192-111.00A.
Fuji Photo Film Co., Ltd.: *See*—
Aoki, Kozo; Seoka, Yoshio; and Yokota, Yukio, 4,327,173, Cl. 430-505.000.
Toda, Yuzo; Kobayashi, Hidetoshi; and Koizumi, Junji, 4,327,175, Cl. 430-546.000.
Fujii, Kazuo, to Sanyo Electric Co., Ltd. Cassette loading and unloading device for video tape recorder. 4,327,385, Cl. 360-96.500.
Fujikubo, Yoshitake; and Tanaka, Mamoru, to Nissan Motor Company, Limited. Battery recharging solar cell arrangement for an automotive vehicle. 4,327,316, Cl. 320-2.000.
Fujimura, Kensuke; Yamamoto, Naomichi; Ogawa, Masahiro; and Tanigawa, Nobuyoshi, to UBE Industries Ltd. Apparatus for dispersing a liquid into another liquid. 4,327,059, Cl. 422-259.000.
Fujisawa, Kiyoji: *See*—
Tomita, Masao; Isaka, Takenobu; Mino, Mineo; and Fujisawa, Kiyoji, 4,327,384, Cl. 360-77.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
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Fujishige, Shoei: *See*—
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Fujishiro, Takeshi: *See*—
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Fujitsu Fanuc Limited: *See*—
Imazeki, Ryoji; and Hattori, Masayuki, 4,327,422, Cl. 365-1.000.
Kawada, Shigeki; Ishida, Hiroshi; and Koiwai, Yutaka, 4,327,315, Cl. 318-811.000.
Fujitsu Limited: *See*—
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Fujiwara, Kiyoshi; Nagatomo, Katsuaki; Yoshinaga, Shoji; Tamura, Zensuke; Shibata, Fumio; and Kanekiyo, Hiroshi, to Hitachi, Ltd. Centrifugal type counterflow contact apparatus. 4,326,666, Cl. 233-15.000.
Fukatsu, Yoshiaki: *See*—
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Fukuoka, Tatsuhiko: *See*—
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Fukushima, Toshihiko: *See*—
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Fukushima, Tsunekazu; Matsunaga, Tomiyuki; and Funakoshi, Satoshi, to Green Cross Corporation, The. Process for heat treatment of aqueous solution containing human blood coagulation factor XIII. 4,327,086, Cl. 424-177.000.
Funakoshi, Satoshi: *See*—
Fukushima, Tsunekazu; Matsunaga, Tomiyuki; and Funakoshi, Satoshi, 4,327,086, Cl. 424-177.000.
Funakoshi, Takashi: *See*—
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Furukawa, Hiroshi: *See*—
Okumura, Yoshiharu; Furukawa, Hiroshi; and Kaneko, Katsumi, 4,327,231, Cl. 568-899.000.
Furuya, Yukitsuna; and Akashi, Fumio, to Nippon Electric Co., Ltd. Signal detector for use in digital communication. 4,327,440, Cl. 375-76.000.
Gaea Trade and Development Company Limited: *See*—
Davies, Ronald C., 4,326,621, Cl. 194-100.00A.
Gage, Douglas M., to Deere & Company. Steering system including accumulator for supplying emergency reserve of fluid. 4,326,558, Cl. 137-554.000.
Gaiser, Conrad J. Deodorant dispenser. 4,327,056, Cl. 422-124.000.
Gaiser, Gerhard O., to American Fabrics Company. Beaming machine. 4,326,322, Cl. 28-187.000.
Gall, John C.; and Meharg, Richard D., to Sears, Roebuck and Co. Foldable wheelchair. 4,326,732, Cl. 280-642.000.
Gall Thomson Maritime Limited: *See*—
Thomson, John G., 4,326,555, Cl. 137-68.00R.
Gallaher Limited: *See*—
Hardwick, Michael J.; and McMeekan, Kenneth R., 4,326,544, Cl. 131-369.000.
Gant, Robert C.; and Reeves, John E., to Halliburton Company. Method and apparatus for monitoring fluid flow. 4,326,411, Cl. 73-155.000.
Garcia, Jose B.; and Bosse-Platiere, Michel J., to Schlumberger Technology Corporation. Shaped charge retention and barrier clip. 4,326,462, Cl. 102-310.000.
Gardner, Beth A.: *See*—
Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth A., 4,327,103, Cl. 424-267.000.
Gardner, Richard N.: *See*—
Dillon, Kenneth R.; and Gardner, Richard N., 4,327,156, Cl. 428-568.000.
Garnett, David M. Relating to bearing assemblies for use in conveyor rollers. 4,326,619, Cl. 193-37.000.
Gatsis, John G.: *See*—
Flagg, John F.; Johnson, Russell W.; and Gatsis, John G., 4,326,945, Cl. 208-8.0LE.
Gauthier, Charles F.; and Martin, Michael L. Casing hanger and stabilizer apparatus and method. 4,326,587, Cl. 166-379.000.
Gdula, Michael; Hodsoll, Raymond J.; and Underkoffler, Edwin C., to General Electric Company. Polyphase reference generator. 4,327,420, Cl. 364-721.000.
Gefitec S.A.: *See*—
Posso, Patrick, 4,326,688, Cl. 248-178.000.
Geier, Leonard W.; and Dunn, Kenneth F., to Raytheon Company. Turbulent solar collector. 4,326,503, Cl. 126-443.000.
Geisthoff, Hubert; and Nienhaus, Clemens, to Jean Walterscheid GmbH. Multipartite protective device for universal joint shafts. 4,326,392, Cl. 64-3.000.
Gelbein, Abraham P., to Lummus Company, The. Nicotinamide production. 4,327,219, Cl. 546-317.000.
Gelderloos, Hendrik J. C.: *See*—
United States of America, National Aeronautics and Space Administration; and Gelderloos, Hendrik J. C., 4,327,437, Cl. 371-68.000.
Genaro, Donald M.: *See*—
Felix, Cristian J.; and Genaro, Donald M., 4,326,620, Cl. 194-1.00A.
General Dynamics, Convair Division: *See*—
Peddie, Gerald D., 4,326,902, Cl. 156-73.100.
General Dynamics, Pomona Division: *See*—
Dugan, William P., 4,326,928, Cl. 204-9.000.
General Electric Company: *See*—
Brooks, Robert B., 4,326,390, Cl. 62-382.000.
Ettinger, Robert H.; and Pasko, Walter J., 4,327,349, Cl. 336-219.000.
Gdula, Michael; Hodsoll, Raymond J.; and Underkoffler, Edwin C., 4,327,420, Cl. 364-721.000.
Giles, Walter B., 4,326,373, Cl. 60-39.020.
Hanneman, Rodney E., 4,327,155, Cl. 428-556.000.
Hershberger, Doran D., 4,327,302, Cl. 310-156.000.

Liu, Yung S., 4,327,337, Cl. 372-3.000.
Mendiratta, Ashok K., 4,327,229, Cl. 568-728.000.
Mossey, Paul W., 4,326,804, Cl. 356-375.000.
Otto, Charles W., 4,326,333, Cl. 29-598.000.
Siemers, Paul A.; and Solomon, Harvey D., 4,327,120, Cl. 427-34.000.
Wallot, George P., 4,327,309, Cl. 315-170.000.
White, James A.; Rice, Frank L.; and Lewis, Walter E., 4,327,274, Cl. 219-10.55R.
Zelahy, John W.; and Raeburn, Alexander, Jr., 4,326,833, Cl. 416-96.00R.

General Electric Company Limited, The: *See—*
Crooks, Stephen J.; and Stevenson, Robert A., 4,327,256, Cl. 179-99.00R.

General Motors Corporation: *See—*
Chakupurakal, Thomas, 4,327,122, Cl. 427-57.000.
Miller, Douglas A., 4,326,432, Cl. 74-475.000.
Wertz, John L., 4,326,835, Cl. 416-193.00A.
Wheadon, Ellis G., 4,327,163, Cl. 429-139.000.

Genter, Melvyn E.; and Potash, Hanan, to Burroughs Corporation. Digital device with interconnect matrix. 4,327,355, Cl. 340-825.900.

Georg Fischer Aktiengesellschaft: *See—*
Lehmann, Ernesto, 4,326,737, Cl. 285-112.000.

Georg Menshen & Co. KG: *See—*
Stahl, Otto; and Schulz, Horst, 4,326,639, Cl. 215-252.000.

George, Larry T.; and Egan, Herbert W., Jr., to Wallace Murray Corporation. Constant belt tension device. 4,326,848, Cl. 474-135.000.

Georgen, Daniel; and Tintignac, Jean P., to Rhone-Poulenc Industries. Process for the preparation of new lysine-containing solid compositions for addition to animal feed. 4,327,118, Cl. 426-656.000.

Geosource Inc.: *See—*
Day, Roger W.; Dunavent, Sidney W.; and Rich, Elvis, 4,326,863, Cl. 55-171.000.

Gerbaz, Giampaolo: *See—*
Imparato, Luigi; Gerbaz, Giampaolo; and Betta, Enrico, 4,327,237, Cl. 585-648.000.

Gerber, Bernard: *See—*
Oguey, Henri; and Gerber, Bernard, 4,327,320, Cl. 323-313.000.

Gerhard Collardin GmbH: *See—*
Konnert, Wolfgang, 4,326,894, Cl. 148-6.14R.

Gernandt, Helmut, to Linde Aktiengesellschaft. Piston and seal assembly. 4,326,724, Cl. 277-171.000.

Gerow, Gordon P., to FMC Corporation. Method of distilling a volatile constituent from a liquid mixture. 4,326,926, Cl. 203-91.000.

Gesellschaft fur Strahlen-und Umweltforschung mbH Munchen: *See—*
Uerpmann, Ernst-Peter; Staupendahl, Gerhard; and Schmidt, Manfred, 4,326,820, Cl. 405-128.000.

GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Gesellschaft m.b.H.: *See—*
Kralowetz, Bruno; and Blaimschein, Gottfried, 4,326,323, Cl. 29-6.000.

Giallombardo, Gary P. Question and answer game employing chance-taking means. 4,326,711, Cl. 273-1.00R.

Gibby, Richard A.; and Potter, Stanley B. Device for removing contaminating particles from lubricating oil. 4,326,953, Cl. 210-168.000.

Giles, Walter B., to General Electric Company. Integrated gas turbine power generation system and process. 4,326,373, Cl. 60-39.020.

Gilliland, John D. Arrangement for monitoring the performance of a digital transmission system. 4,327,356, Cl. 340-825.770.

Gilson Medical Electronics: *See—*
Gilson, Robert E.; Foster, George W.; and Bonneyrat, Alain M., 4,326,837, Cl. 417-12.000.

Gilson, Robert E.; Foster, George W.; and Bonneyrat, Alain M., to Gilson Medical Electronics. Pumping apparatus using a stepping motor. 4,326,837, Cl. 417-12.000.

GKN Sankey Limited: *See—*
Powell, Robin F., 4,326,615, Cl. 192-93.00R.

Gladysz, Carl V.: *See—*
McAllister, John H.; Stewart, Lindsay G.; Gladysz, Carl V.; and Wilson, Jim, 4,326,887, Cl. 75-257.000.

Glatt, Werner, to Werner Glatt GmbH. Rotatable coating vessel. 4,326,480, Cl. 118-50.000.

Glatthorn, Raymond, to Westinghouse Electric Corp. Apparatus for continuously welding a portion of a row of tubes to a tubesheet. 4,327,269, Cl. 219-60.200.

Glaxo Group Limited: *See—*
Collington, Eric W.; Hallett, Peter; and Wallis, Christopher J., 4,327,092, Cl. 424-246.000.

Gockler, Heinz; and Hofmeister, Hagen, to Licentia-Patent-Verwaltungs-G.m.b.H. Method for generating modem transmission signals with quadrature amplitude modulation. 4,327,439, Cl. 375-67.000.

Godar, Richard L.: *See—*
Hendricks, Carl C.; Godar, Richard L.; and Roux, Kenneth R., 4,326,987, Cl. 252-392.000.

Goddijn, Bernardus H. A., to U.S. Philips Corporation. Stepping motor. 4,327,299, Cl. 310-49.00R.

Goetz AG: *See—*
Bornefeld, Horst; Fort, Hans P.; and Engel, Werner, 4,326,907, Cl. 156-212.000.

Goguen, Robert P. Anti-siphon selector valve. 4,326,671, Cl. 239-66.000.

Goldstein, Albert: *See—*
Parry, James L.; Redden, Martin J.; and Goldstein, Albert, 4,326,466, Cl. 104-172.00S.

Goloff, Alexander, to Caterpillar Tractor Co. Rotary fuel injection apparatus. 4,326,672, Cl. 239-91.000.

Gomi, Hiroshi, to Tokyo Shibaura Electric Co., Ltd. Composite color signal processing circuit. 4,327,373, Cl. 358-28.000.

Gongwer, Calvin A., to Innerspace Corporation. Fluid control valve. 4,326,554, Cl. 137-14.000.

Goodyear Aerospace Corporation: *See—*
Fretz, George C., III, 4,326,755, Cl. 303-96.000.
Ruof, Edgar J., 4,327,413, Cl. 364-426.000.

Gordon, Frank J.: *See—*
Scianna, Anthony, Sr.; and Gordon, Frank J., 4,326,660, Cl. 226-190.000.

Goto, Motohiro: *See—*
Endo, Yasuhiko; Mimori, Takashi; and Goto, Motohiro, 4,327,188, Cl. 501-134.000.

Graben, Melvin M.: *See—*
Spencer, Homer K.; and Graben, Melvin M., 4,326,879, Cl. 71-94.000.

Gradek, Walter A.; and Boggs, John W., to Foam Design, Incorporated. Vehicle roof carrier for skis and ski poles. 4,326,655, Cl. 224-324.000.

Gramlich, Otto K.: *See—*
Wirz, Arno; Sobotta, Peter; Arendt, Franz; and Gramlich, Otto K., 4,327,135, Cl. 428-600.000.

Granda, Edward J.: *See—*
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,326,998, Cl. 252-522.00R.

Granryd, Thorvald G. Low cost vehicle traction device employing pivotally mounted anchoring means. 4,326,668, Cl. 238-14.000.

Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., to Standard Oil Company, The. Production of unsaturated nitriles. 4,327,037, Cl. 260-465.300.

Graves, Daniel F.: *See—*
Fieldhouse, John W.; and Graves, Daniel F., 4,327,063, Cl. 423-300.000.

Gray, John B.: *See—*
Pipe, William J. C.; and Gray, John B., 4,326,384, Cl. 62-62.000.

Gray, Lorin S., III, to Scott Paper Company. Release coatings. 4,327,121, Cl. 427-44.000.

Great Lakes Chemical Corporation: *See—*
Ayres, James T.; McAllister, David L.; and Sands, John L., 4,327,227, Cl. 568-639.000.

Green Cross Corporation, The: *See—*
Fukushima, Tsunekazu; Matsunaga, Tomiyuki; and Funakoshi, Satoshi, 4,327,086, Cl. 424-177.000.

Greenwood, Ivan A.; and Simpson, James H., to Singer Company, The. All-angle gradient magnetometer. 4,327,327, Cl. 324-304.000.

Gregory, Floyd A.; Manning, Donald F.; Oranchak, William; and Student, Joseph J., deceased (by Student, Sophie A., administratrix), to International Business Machines. Evacuated printing platen. 4,326,656, Cl. 226-59.000.

Grihalva, Lawrence A. Rollerskate carrier. 4,326,746, Cl. 294-146.000.

Groke, Karl, to Chemie Linz Aktiengesellschaft. Aqueous solution for intravenous administration. 4,327,084, Cl. 424-176.000.

Grove, John L.; and Kuhne, Frederick W., to JLG Industries, Inc. Aerial lift platform apparatus with capacity indicator. 4,326,601, Cl. 182-2.000.

Grove, William S.: *See—*
Richter, Sidney B.; and Grove, William S., 4,326,882, Cl. 562-472.000.

Grundmann, Edgard: *See—*
Bernhardt, Winfried; Grundmann, Edgard; and Kroll, Rudolf, 4,326,500, Cl. 126-426.000.

Grune, Burkhard: *See—*
Kratel, Gunter; Dummer, Gerhard; Niessner, Peter; Grune, Burkhard; and Stohr, Gunter, 4,326,852, Cl. 23-293.00R.

Gruss, John E. Urine collection procedure for cats and apparatus therefor. 4,326,481, Cl. 119-1.000.

Grzebielski, Chester J., to Allen-Bradley Company. Motor protection circuit. 4,327,391, Cl. 361-31.000.

GTE Laboratories Incorporated: *See—*
MacDonald, Malcolm F., 4,327,328, Cl. 328-55.000.

Guadard, Yves; and Guillemaud, Henri, to Rhone-Poulenc-Textile. Textile solar collector. 4,326,504, Cl. 126-449.000.

Guenon, Jean-Pierre, to Sperry Corporation. Bale wagons. 4,326,828, Cl. 414-39.000.

Guerrero, Jorge; Mellon, Alice D.; Fritz, Charles G.; and Doddi, Namassivaya, to Pitman-Moore, Inc. Mesh-covered bolus. 4,326,522, Cl. 128-/260.000.

Guibert, Raul. Two-zone hot air oven for food-loaded cartridges. 4,326,497, Cl. 126-261.000.

Guibert, Raul, to Sunsetl, Ltd. Counter-top reheating unit for packaged pre-cooked meals. 4,327,279, Cl. 219-400.000.

Guier and Affiliates, Inc.: *See—*
Guier, William C., 4,326,745, Cl. 294-90.000.

Guier, William C., to Guier and Affiliates, Inc. Link control system for use with dual elevators. 4,326,745, Cl. 294-90.000.

Guier, Richard S., to E. J. Brooks Company. Security seal. 4,326,740, Cl. 292-307.00B.

Guillemaud, Henri: *See—*
Guadard, Yves; and Guillemaud, Henri, 4,326,504, Cl. 126-449.000.

Guillot, Preston F.; and Guthrie, Sheldon W., Jr. Hydraulic power tong. 4,326,435, Cl. 81-57.340.

Gulf & Western Manufacturing Company: *See—*
West, Archie; and Radadia, Dhirajlal B., 4,327,001, Cl. 524-322.000.

Gundersen, Ray S.; Colledge, Ronald J.; Jenkins, Roy H.; and Crook, Michael, to Sverdrup & Parcel and Associates, Inc. Drive control

arrangement for swing arm material sampler. 4,326,425, Cl. 73-863.530.
Guterman, Daniel C., to Texas Instruments Incorporated. High coupling ratio electrically programmable ROM. 4,326,331, Cl. 29-571.000.
Guthrie, Phillip K.; and Pillow, Richard W., to Fitness Concepts, Inc. Jogging glove. 4,326,706, Cl. 272-119.000.
Guthrie, Sheldon W., Jr.: *See*—
Guillot, Preston F.; and Guthrie, Sheldon W., Jr., 4,326,435, Cl. 81-57.340.
Gutman, Arnold D., to Stauffer Chemical Company. N-Aryl, 2-phenoxy nicotinamide compounds and the herbicidal use thereof. 4,327,218, Cl. 546-291.000.
Gyi, Ko Ko: *See*—
DeMoss, Dean; Blessum, Norman S.; Gyi, Ko Ko; and Ragle, Herbert U., 4,327,386, Cl. 360-99.000.
Haag, Peter C.: *See*—
Oka, Ken K.; and Haag, Peter C., 4,326,594, Cl. 172-328.000.
Haag, Werner O.; and Lago, Rudolph M., to Mobil Oil Corporation. Enhancement of zeolite catalytic activity. 4,326,994, Cl. 252-455.00Z.
Haas, Georges: *See*—
Sele, Alex; Ferrini, Pier G.; Haas, Georges; Jaeggi, Knut A.; and Rossi, Alberto, 4,327,091, Cl. 424-246.000.
Hack, Joachim: *See*—
Schaefer, Dieter; Motz, Herbert; Mayer, Dieter; Deigner, Paul; Hack, Joachim; and Falk, Roland, 4,327,139, Cl. 428-65.000.
Haendler & Natermann GmbH: *See*—
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Haga, Takahiro; Toki, Tadaaki; Koyanagi, Toru; and Imai, Osamu, to Ishihara Sangyo Kaisha Ltd. O-(N-Alkoxy-pyridinecarboximidoyl) phosphates, process for producing the same, and insecticidal or acaridical compositions containing the same. 4,327,089, Cl. 424-200.000.
Hagberg, Carl E. Recreational kit for constructing objects. 4,326,354, Cl. 46-26.000.
Hageniers, Omer L.: *See*—
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; Clarke, Donald A.; and Richards, Blaine, 4,326,808, Cl. 356-445.000.
Hagino, Hiroshi; Odagiri, Hideo; and Okutani, Junichi, to Kyowa Hakko Kogyo Co., Ltd. Draft device for a bubble column. 4,327,042, Cl. 261-77.000.
Halbach & Braun: *See*—
Braun, Ernst; and Braun, Gert, 4,326,674, Cl. 241-35.000.
Halcyon, Inc.: *See*—
Zumbahlen, Louis H., Jr.; and Volkland, Charles, 4,327,258, Cl. 179-175.30R.
Hall, William B., to RCA Corporation. Megasonic jet cleaner apparatus. 4,326,553, Cl. 134-153.000.
Hallett, Peter: *See*—
Collington, Eric W.; Hallett, Peter; and Wallis, Christopher J., 4,327,092, Cl. 424-246.000.
Halliburton Company: *See*—
Gant, Robert C.; and Reeves, John E., 4,326,411, Cl. 73-155.000.
Hamada, Morio, to Shinwa Audio Company, Ltd. Indication element driving device. 4,326,430, Cl. 74-10.520.
Hamm, Earl L. Toilet tissue holder. 4,326,678, Cl. 242-55.200.
Hammar, Walton J., to Minnesota Mining and Manufacturing Company. Antithrombogenic articles. 4,326,532, Cl. 128-349.00R.
Hammill, Janet L.: *See*—
Alvino, William M.; Hammill, Janet L.; and Seidel, Martin P., 4,327,143, Cl. 428-236.000.
Hammond, Kenneth G.; and Chafetz, Harry, to Texaco Inc. Quaternary ammonium succinimide salt composition and lubricating oil containing same. 4,326,973, Cl. 252-34.000.
Hamprecht, Gerhard; Parg, Adolf; and Koenig, Karl-Heinz, to BASF Aktiengesellschaft. Sulfamic acid halides and processes for the preparation of sulfamic acid halides. 4,327,034, Cl. 260-455.00A.
Hanneman, Rodney E., to General Electric Company. Coated metal structures and method for making. 4,327,155, Cl. 428-556.000.
Hansen, Guenter: *See*—
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Hao, Paul L. C.; Hsu, W. W.; Lin, W. S.; Tong, S. N.; Hung, H. K.; and Chang, M. C., to Industrial Technology Research Institute. Polymerization process for the production of PVC latex and paste resin. 4,327,003, Cl. 523-336.000.
Harding, Bruce L., to Smith Valve Corporation. Valve and actuator assembly for railroad car air brake system. 4,326,754, Cl. 303-81.000.
Hardman, Harley F.: *See*—
Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,327,037, Cl. 260-465.300.
Hardwick, Michael J.; and McMeekan, Kenneth R., to Gallaher Limited. Smoking product. 4,326,544, Cl. 131-369.000.
Harmant, Michel, to Ems Industrie. Metal cutting machines. 4,326,440, Cl. 83-482.000.
Harmon, Paul E.: *See*—
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Harnisch, Horst: *See*—
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Harper, Patrick D., to Bendix Corporation, The. Inductive load drive circuit utilizing a bi-level output comparator and a flip-flop to set three different levels of load current. 4,327,394, Cl. 361-154.000.
Harper, Stanley A.: *See*—
Levine, Aaron W.; Tomeczek, Kazimiera D.; and Harper, Stanley A., 4,327,123, Cl. 427-64.000.
Harris, Walter W., to Manville Service Corporation. Cooling tubes for glass filament production apparatus. 4,326,871, Cl. 65-12.000.
Harrison, Hubert H. System for generating energy from tidal activity. 4,327,297, Cl. 290-53.000.
Hartemann, Pierre, to Thomson-CSF. Pressure transducer with elastic surface waves and ignition system for internal combustion engine utilizing this transducer. 4,326,423, Cl. 73-861.630.
Hartmann & Braun Aktiengesellschaft: *See*—
Zochbauer, Michael, 4,326,807, Cl. 356-418.000.
Hashimoto, Kazunori: *See*—
Tanaka, Satoru; Shimada, Katsutoshi; Hashimoto, Kazunori; Ema, Kiichi; and Ueda, Koichiro, 4,327,217, Cl. 546-281.000.
Hashimoto, Mitsuru, to Ricoh Co., Ltd. Electrophotographic element containing disazo pigment charge generating material. 4,327,168, Cl. 430-57.000.
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Hatcher, Ian: *See*—
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Hatter, Edwin E.: *See*—
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Hattori, Katsuhide; Fukatsu, Yoshiaki; and Takahashi, Masao, to Nippon Oil and Fats Company Limited. Water-in-oil emulsion explosive composition. 4,326,900, Cl. 149-2.000.
Hattori, Masayuki: *See*—
Imazeki, Ryoji; and Hattori, Masayuki, 4,327,422, Cl. 365-1.000.
Hausch, Walter R., to Firestone Tire & Rubber Company, The. Application of ambient temperature cured polymers or prepolymers to a cured elastomer. 4,327,138, Cl. 428-36.000.
Hausherr, George F. Stereoscopic picture system. 4,326,772, Cl. 350-134.000.
Hawes, Richard J., to Ransomes Sims & Jefferies Limited. Reversible ploughs. 4,326,593, Cl. 172-226.000.
Hay, Gerard J.: *See*—
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Hayashi, Yoshio: *See*—
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Hayden, Ralph P., Jr.; and Barksdale, Joe M., to Kaiser Steel Corporation. Lance apparatus. 4,326,701, Cl. 266-225.000.
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Heider, Joachim: *See*—
Austel, Volkhard; Reiffen, Manfred; Heider, Joachim; and Diederen, Willi, 4,327,100, Cl. 424-256.000.
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Heine, Helmut A.; and Schmidt, Otto H., to Propper Manufacturing Co., Inc.; and Heine, Optotechnik GmbH & Co. KG. Apparatus for charging a rechargeable battery. 4,327,317, Cl. 320-23.000.
Heine, Optotechnik GmbH & Co. KG: *See*—
Heine, Helmut A.; and Schmidt, Otto H., 4,327,317, Cl. 320-23.000.
Heitert, John S., to Ford Motor Company. Proportional flow fuel vapor purge control device. 4,326,489, Cl. 123-520.000.
Heitz, Walter; and Ball, Peter, to Bayer Aktiengesellschaft. Process for the preparation of carbonic acid esters. 4,327,035, Cl. 260-463.000.
Heller, Peter N.: *See*—
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Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth A., to Hoechst-Roussel Pharmaceuticals Incorporated. 3-{3-[4-(4-Fluorobenzoyl)piperidyl]propyl}-2-methyl indole. 4,327,103, Cl. 424-267.000.
Hemex, Inc.: *See*—
Klawitter, Jerome J., 4,326,304, Cl. 3-1.500.
Henderson, Mary M. Coolant band. 4,326,533, Cl. 128-402.000.
Henderson, Timothy M.; and Kool, Lawrence B., to United States of America, Energy. Method of fabricating nested shells and resulting product. 4,327,192, Cl. 521-56.000.
Henderson, Wilmer P.: *See*—
King, Paul V.; Becher, Albert F.; and Henderson, Wilmer P., 4,326,468, Cl. 109-49.500.
Hendricks, Carl C.; Godar, Richard L.; and Roux, Kenneth R., to Petrolite Corporation. Reaction products of alkyl and alkenyl succinic acids and ether diamines. 4,326,987, Cl. 252-392.000.
Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Blum, Helmut; and Worms, Karl-Heinz, 4,327,039, Cl. 260-502.500.
Henning, Sten A.: *See*—
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Hennings, Jurgen: *See*—
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Henricks, Arthur R., to United States Steel Corporation. Method of continuous annealing low-carbon electrical sheet steel and duplex product produced thereby. 4,326,899, Cl. 148-120.000.
Henry, Raymond; Bouvet, Jean-Victor; Chapard, Alain; and Simon, Jacques, to Thomson-CSF. Method of coupling between an optical

fiber and an optoelectronic diode, and a transmitting or receiving head fabricated by means of said method. 4,326,771, Cl. 350-96.170.
Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence: *See—*
Cornish, William D.; and Tucker, Trevor W., 4,327,336, Cl. 331-8.000.
Heraeus Quarzschmelze GmbH: *See—*
Bruning, Rolf; and Roth, Jurgen, 4,327,057, Cl. 422-173.000.
Herden, Werner, to Robert Bosch GmbH. Electromechanical pressure transducer. 4,326,419, Cl. 73-708.000.
Heritage Products Intl., Inc.: *See—*
Barth, Duane D., 4,326,352, Cl. 40-607.000.
Hermann, John A.; and Lucid, Michael F., to Kerr-McGee Chemical Corporation. Method of stabilizing wet process phosphoric acid for solvent extraction. 4,327,061, Cl. 423-8.000.
Hermann Schleicher GmbH & Co.: *See—*
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Herr Dipl.-Ing. M. G. Dronsek: *See—*
Lasermann, Franz; and Wittenbreder, Eduard, 4,326,824, Cl. 409-132.000.
Herron, John T.: *See—*
Martinez, Richard I.; and Herron, John T., 4,327,233, Cl. 585-357.000.
Hershberger, Doran D., to General Electric Company. Electronically commutated motor, stationary and rotatable assemblies therefore, and lamination. 4,327,302, Cl. 310-156.000.
Herth, Harro; Peter, Cornelius; and Schnurle, Hans, to Robert Bosch GmbH. System for increasing the fuel feed in internal combustion engines during acceleration. 4,326,488, Cl. 123-492.000.
Hervig, Harold C., Jr.: *See—*
Hunder, David N.; and Hervig, Harold C., Jr., 4,326,735, Cl. 285-15.000.
Herzig, Alfred: *See—*
Murzin, Horst; Woss, Rainer; Burghoff, Hans; Schmieder, Frank; Herzig, Alfred; Junge, Johannes; and Deckarm, Gunter, 4,326,625, Cl. 198-653.000.
Hess, Paul D., to Allis-Chalmers Corporation. Suspension preheater for cement calcining plant. 4,326,845, Cl. 432-106.000.
Hewlett-Packard Company: *See—*
Schafter, William; and Bradley, Terrag W., 4,327,366, Cl. 346-76.0PH.
Heyman, Arnold M.: *See—*
Eckels, John F., 4,326,541, Cl. 128-766.000.
Heyman, Duane A.: *See—*
Ramlow, Gerhard G.; Heyman, Duane A.; and Moore, Richard A., 4,327,005, Cl. 524-377.000.
Heyman, Philip M.; and Quinn, Robert L., to RCA Corporation. Workpiece with machine-readable marking recessed therein and method of making same. 4,327,283, Cl. 235-487.000.
Heywood, Joseph R.; and Ainsworth, Leonard H. Display devices. 4,326,351, Cl. 40-467.000.
Hi-G Incorporated: *See—*
Luckenbach, David, 4,327,344, Cl. 335-253.000.
Hi Shear Corporation: *See—*
Volkmann, Josef F.; Hatter, Edwin E.; and Schuster, Michael M., 4,326,825, Cl. 411-5.000.
Hi-Tech Industries, Inc.: *See—*
Kaplan, Neil, 4,327,369, Cl. 357-72.000.
Hickmann, Eckhard; Oeser, Heinz-Guenter; and Moebius, Leander, to BASF Aktiengesellschaft. Preparation of erythro-α-piperid-2-yl-2,8-bis-(trifluoro-methyl)-quinolin-4-methanol. 4,327,215, Cl. 546-176.000.
Hicks, Douglas C.; and Pleass, Charles M., to University of Delaware. Wave driven pump. 4,326,840, Cl. 417-331.000.
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Marino, Samuel F.; and Hidding, Daniel P., 4,326,649, Cl. 222-182.000.
Hill, Donald J., to Westinghouse Electric Corp. Nuclear core arrangement. 4,326,919, Cl. 376-267.000.
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Hillemanns, Herbert: *See—*
Carneim, Wilfried; Hillemanns, Herbert; Vollmecke, Hermann; Ribken, Hans; Schumacher, Heinz; and Roether, Kurt, 4,326,699, Cl. 266-114.000.
Hilti Aktiengesellschaft: *See—*
Koob, Friedrich, 4,326,632, Cl. 206-389.000.
Himy, Albert; and Wagner, Otto C., to United States of America, Navy. Stabilized nickel-zinc battery. 4,327,157, Cl. 429-61.000.
Hinden, Milton, to Hinden Trust, The. Method for spot welding galvanized sheet metal. 4,327,272, Cl. 219-94.000.
Hinden Trust, The: *See—*
Hinden, Milton, 4,327,272, Cl. 219-94.000.
Hinding, John H. Dental hygiene appliance. 4,326,549, Cl. 132-92.00R.
Hinds, Robert S. Method for using elastic cable exercizer bar. 4,326,708, Cl. 272-138.000.
Hines, William W.; and Cwirzen, Casimir Z., to Northern Telecom, Inc. Protector module base assembly with an external spark gap. 4,327,393, Cl. 361-119.000.
Hiraga, Keishiro: *See—*
Katoh, Tsuneyuki; Hiraga, Keishiro; Seki, Junji; and Suzuki, Makoto, 4,327,149, Cl. 428-332.000.
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Hirata, Noritsugu; Toyama, Masamichi; Okajima, Hidekazu; and Nishimura, Akimasa, to Canon Kabushiki Kaisha. Photographic camera. 4,326,790, Cl. 354-288.000.
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Hiratake, Susumu: *See—*
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Hirayama, Hiromitsu, to TDK Electronics Co., Ltd. Variable leakage transformer. 4,327,348, Cl. 336-184.000.
Hirotani, Tatsushi: *See—*
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Hirs, Gene. Granular filter medium. 4,326,964, Cl. 210-793.000.
Hitachi Construction Machinery Co. Ltd.: *See—*
Kusumi, Hiroshi; and Wada, Masami, 4,326,736, Cl. 285-98.000.
Hitachi Denshi Kabushiki Kaisha: *See—*
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Fujiwara, Kiyoshi; Nagatomo, Katsuaki; Yoshinaga, Shoji; Tamura, Zensuke; Shibata, Fumio; and Kanekiyo, Hiroshi, 4,326,666, Cl. 233-15.000.
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Kita, Hisanao; Karatsu, Yoshinori; Nakazaki, Takamitsu; and Akutsu, Yoji, 4,327,273, Cl. 219-121.0EC.
Kuzunuki, Soshiro; Hirasawa, Kotaro; Sakata, Kazuhiro; and Yoneda, Kenji, 4,326,606, Cl. 187-29.00R.
Ohara, Susumu; Horiki, Akira; Miyazaki, Katsuyuki; and Tokunaga, Kaoru, 4,327,436, Cl. 370-110.100.
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Hiya, Koji; Miyoshi, Yoshiyuki; and Machida, Kanji, to Matsushita Electric Industrial Co., Ltd. Process of producing roll-shaped magnet. 4,326,908, Cl. 156-215.000.
Hobart Corporation: *See—*
Voorhees, John E., 4,326,551, Cl. 134-58.00D.
Hockenbrock, Richard L.; and Schwartz, James W., to Zenith Radio Corporation. Apparatus and method for spot-knocking television picture tube electron guns. 4,326,762, Cl. 316-1.000.
Hodsoll, Raymond J.: *See—*
Gdula, Michael; Hodsoll, Raymond J.; and Underkoffler, Edwin C., 4,327,420, Cl. 364-721.000.
Hoechst Aktiengesellschaft: *See—*
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Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth A., 4,327,103, Cl. 424-267.000.
Hoff, Stephen J., to Hoffco, Inc. Clutch and brake for rotary lawn mower. 4,326,368, Cl. 56-11.300.
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Hoff, Stephen J., 4,326,368, Cl. 56-11.300.
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Branca, Quirico; Fischli, Albert E.; and Szente, Andre', 4,327,026, Cl. 260-239.30D.
Montavon, Marc; and Reiner, Roland, 4,327,210, Cl. 544-027.000.
Shinma, Nobuo; Umeda, Isao; Ishitsuka, Hideo; and Suhara, Yasuji, 4,327,088, Cl. 424-180.000.
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Gockler, Heinz; and Hofmeister, Hagen, 4,327,439, Cl. 375-67.000.
Hohne, Karl, to Siemens Aktiengesellschaft. Diaphragms for electrochemical cells and the manufacture thereof. 4,326,914, Cl. 162-105.000.
Hoki, Tsuneo; and Matsuki, Yutaka, to Asahi-Dow Limited. Foaming synthetic resin compositions stabilized with certain higher ethers, esters or anhydrides. 4,327,193, Cl. 521-88.000.
Holden, Kenneth G.; Kaiser, Carl; and Weinstock, Joseph, to Smith-Kline Corporation. Intermediates for preparing 7,8-amino, hydroxy-1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepines. 4,327,023, Cl. 260-239.0BB.
Holleck, Gerhard L., to EIC Laboratories, Inc. Metal/gas battery. 4,327,158, Cl. 429-101.000.
Hollman, Bernd: *See—*
Rohrbach, Gerhard; and Hollman, Bernd, 4,326,471, Cl. 110-341.000.

Holloway, David G.: *See—*
Massey, Roger G.; and Holloway, David G., 4,326,627, Cl. 200-47.000.

Holmes, David A. Water-removing system for a catamaran boat. 4,326,478, Cl. 114-183.00R.

Holt, Dewilton R., to Siemens Corporation. Read circuit for a floppy disk drive. 4,327,383, Cl. 360-45.000.

Holtzer, Mariusz: *See—*
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Honjo, Masaru: *See—*
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Hooker Chemicals & Plastics Corp.: *See—*
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Hopkins, Melvyn D.; and Bolin, Philip C., to Westinghouse Electric Corp. Gas insulated transmission line with adhesive particle trap carrier. 4,327,243, Cl. 174-14.00R.

Horibe, Kiyoshi: *See—*
Kawashima, Kenichi; Horibe, Kiyoshi; and Degawa, Takashi, 4,326,838, Cl. 417-269.000.

Horiguchi, Michiyuki, to Sharp Kabushiki Kaisha. DC Power supply circuit. 4,327,404, Cl. 363-19.000.

Horiki, Akira: *See—*
Ohara, Susumu; Horiki, Akira; Miyazaki, Katsuyuki; and Tokunaga, Kaoru, 4,327,436, Cl. 370-110.100.

Horn, Klaus: *See—*
Sander, Jurgen; and Horn, Klaus, 4,327,170, Cl. 430-285.000.

Horn, Werner; and Hennings, Jurgen, to Swiss Aluminium Ltd. Process for manufacturing aluminum strip or sheet having improved weldability. 4,326,895, Cl. 148-11.50A.

Horres, Charles R.: *See—*
Buck, Robert T.; and Horres, Charles R., 4,326,526, Cl. 128-272.000.

Horvath, Imre; and Kwasnitza, Kurt, to BBC Brown, Boveri & Company, Limited. Superconductive cable. 4,327,244, Cl. 174-15.00S.

Hosokawa, Motoyuki: *See—*
Isogai, Nobuo; Hosokawa, Motoyuki; Okawa, Takashi; and Wakui, Natsuko, 4,327,225, Cl. 560-205.000.

Hosokawa, Yasuhiko; Katsuki, Kanji; and Suzuki, Toshio, to Mitsubishi Kenki Kabushiki Kaisha. Inverter system for driving synchronous motor. 4,327,314, Cl. 318-722.000.

Hoss, Robert J., to Rockwell International Corporation. Meter rotor rotation optical sensor. 4,327,362, Cl. 340-870.020.

Hotta, Mitsuhiko; Tachibana, Akifumi; and Shigihara, Takanori, to Kabushiki Kaisha Morita Seisakusho. System of automatically controlling distance in linear movement. 4,327,427, Cl. 367-118.000.

Houlberg, Don M., to Joerns Furniture Company. Solenoid activated spring clutch. 4,326,613, Cl. 192-21.000.

Houston Tong Services, Inc.: *See—*
Bryant, Bill R., 4,326,602, Cl. 182-82.000.

Hoven, Wilhelm. Helical sliding drive starter. 4,327,300, Cl. 310-75.00C.

Howard, Kenneth J.; and Sidwell, Albert E., to Vertac Chemical Corporation. Chemical detoxification of toxic chlorinated aromatic compounds. 4,327,027, Cl. 260-340.300.

Howard, Richard E.; and Hu, Evelyn L., to Bell Telephone Laboratories, Incorporated. Reactive ion etching of III-V compounds including InP, GaAs-InP and GaAlAs. 4,326,911, Cl. 156-643.000.

Howson, David C.: *See—*
Axelgaard, Jens; Howson, David C.; and Perhay, John A., 4,326,534, Cl. 128-421.000.

Hoxmeier, Ronald J.: *See—*
Slaugh, Lynn H.; and Hoxmeier, Ronald J., 4,326,992, Cl. 252-443.000.

Hreha, Michael J. Gauge. 4,326,336, Cl. 33-174.00Q.

HSA Reactors Limited: *See—*
Das Gupta, Sankar; Jacobs, James K.; and Mohanta, Samaresh, 4,326,938, Cl. 204-228.000.

Hsu, W. W.: *See—*
Hao, Paul L. C.; Hsu, W. W.; Lin, W. S.; Tong, S. N.; Hung, H. K.; and Chang, M. C., 4,327,003, Cl. 523-336.000.

Hu, Evelyn L.: *See—*
Howard, Richard E.; and Hu, Evelyn L., 4,326,911, Cl. 156-643.000.

Huang, Henry V. Automated method for quantitative analysis of biological fluids. 4,327,073, Cl. 424-1.000.

Hucks, Uwe: *See—*
Lehr, Gunter; Hucks, Uwe; Vernaleken, Hugo; Nielinger, Werner; and Tresper, Erhard, 4,327,208, Cl. 528-323.000.

Huffnagle, Clifton W.: *See—*
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Hughes Aircraft Company: *See—*
Fitts, John M., 4,326,800, Cl. 356-152.000.
Rosen, Harold A., 4,326,684, Cl. 244-158.00R.
Wang, Victor; and Seliger, Robert L., 4,327,292, Cl. 250-491.000.

Hughes, John M. O. Situ bore hole test probe. 4,326,409, Cl. 73-84.000.

Hunder, David N.; and Hervig, Harold C., Jr., to Minnesota Mining & Manufacturing Company. Mold useful in sealing leaks in pipes. 4,326,735, Cl. 285-15.000.

Hung, H. K.: *See—*
Hao, Paul L. C.; Hsu, W. W.; Lin, W. S.; Tong, S. N.; Hung, H. K.; and Chang, M. C., 4,327,003, Cl. 523-336.000.

Hunt-Wesson Foods, Inc.: *See—*
Marino, Samuel F.; and Hidding, Daniel P., 4,326,649, Cl. 222-182.000.

Hunter, Walter D., to Texaco Development Corp. Process for secondary recovery. 4,326,969, Cl. 252-8.55D.

Hussmann Refrigerator Co.: *See—*
Friedman, Donald E., 4,326,387, Cl. 62-184.000.

Hutson, Richard L.: *See—*
Doss, James D.; and Hutson, Richard L., 4,326,529, Cl. 128-303.100.

Hwang, Top-Ping; and Feng, Chin-Liang. Simplified power source for fluorescent lamps. 4,327,308, Cl. 315-99.000.

Hydro AG-Tech, Inc.: *See—*
Engle, Carl E.; and Moldenhauer, Donald, 4,326,675, Cl. 241-236.000.

Hynecek, Jaroslav: *See—*
Chapman, Richard A.; Kinch, Michael A.; and Hynecek, Jaroslav, 4,327,291, Cl. 250-332.000.

Ibamoto, Masahiko: *See—*
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Ibigawa Electric Industry Co., Ltd.: *See—*
Kato, Kunio; Sugiyama, Yoshiki; and Enomoto, Ryo, 4,327,067, Cl. 423-345.000.

Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Refrigerated merchandiser cabinet with air defrost ports. 4,326,385, Cl. 62-82.000.

Ichinomiya, Tsutomu: *See—*
Kitagawa, Fumio; and Ichinomiya, Tsutomu, 4,326,536, Cl. 128-682.000.

Ichiyanagi, Toshikazu, to Canon Kabushiki Kaisha. Information display device for camera. 4,326,784, Cl. 354-53.000.

Idel, Karsten: *See—*
Druschke, Frank; Margotte, Dieter; Cohnen, Wolfgang; and Idel, Karsten, 4,327,015, Cl. 524-162.000.

Igano, Ken'ichi: *See—*
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Ihara Chemical Industry Co., Ltd.: *See—*
Oyaizu, Yoshijiro; Koike, Wataro; and Yazawa, Chihiro, 4,327,204, Cl. 528-61.000.

Ihde, Richard C.: *See—*
Thompson, Kenneth P.; and Ihde, Richard C., 4,327,136, Cl. 428-35.000.

Ikeda, Nobuo; and Yoshimura, Hirofumi, to Matsushita Electric Industrial Co., Ltd. High frequency energy supply in a high frequency heating appliance. 4,327,267, Cl. 219-10.55F.

Ikeda, Takashi; and Ayano, Shinya, to Tokyo Shibaura Denki Kabushiki Kaisha. Exhaust outer casing. 4,326,832, Cl. 415-219.00R.

Ilmensky, Vladimir V.: *See—*
Moroz, Viktor M.; Lezin, Nikolai Y.; Pavlov, Tengiz A.; and Ilmensky, Vladimir V., 4,326,756, Cl. 308-3.900.

Imai, Osamu: *See—*
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Imamura, Akio; and Oya, Akiyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic performance device. 4,326,441, Cl. 84-1.030.

Imamura, Naoki: *See—*
Ono, Junichi; Fukui, Isao; and Imamura, Naoki, 4,326,801, Cl. 356-313.000.

Imazeki, Ryoji; and Hattori, Masayuki, to Fujitsu Fanuc Limited. Power source device for bubble memory unit. 4,327,422, Cl. 365-1.000.

Imparato, Luigi; Gerbaz, Giampaolo; and Betta, Enrico, to Agip Petroli, S.p.A. Process for preparing viscosity index improvers for lubricating oils by cracking synthetic rubbers in the liquid phase. 4,327,237, Cl. 585-648.000.

Imperial Chemical Industries Limited: *See—*
Cogswell, Frederic N.; and Mitchell, David T., 4,327,053, Cl. 264-515.000.
Smith, Leslie H., 4,327,113, Cl. 424-321.000.

Industrial Technology Research Institute: *See—*
Hao, Paul L. C.; Hsu, W. W.; Lin, W. S.; Tong, S. N.; Hung, H. K.; and Chang, M. C., 4,327,003, Cl. 523-336.000.

Industrie Pirelli, S.p.A.: *See—*
Metra, Piero, 4,327,245, Cl. 174-19.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Pasini, Arnaldo; and Knirsch, Franco, 4,326,812, Cl. 400-121.000.

Ingenuity Incorporated: *See—*
Miles, Felix A.; and Roush, Dale P., 4,326,315, Cl. 15-77.000.

Inger, Siegfried, to Palitex Project-Company GmbH. Apparatus for braking and positioning a spinning or twisting spindle. 4,326,372, Cl. 57-88.000.

Ingersoll-Rand Company: *See—*
Larson, John A.; and Fischer, Robert B., 4,326,885, Cl. 75-125.000.

Ingle, Harold R., Jr. Apparatus for detecting bonding defects in laminates. 4,326,405, Cl. 73-37.000.

Ingram, Harry T.; and Ingram, Larry R., to Woodtech, Inc. Wood molding routing apparatus. 4,326,572, Cl. 144-133.00R.

Ingram, Larry R.: *See—*
Ingram, Harry T.; and Ingram, Larry R., 4,326,572, Cl. 144-133.00R.

Ingram, W. Frank. Method and apparatus for inserting and removing soft contact lens. 4,326,742, Cl. 294-1.0CA.
Injushin, Viktor M.; Khokhlov, Valentin I.; Akhremenko, Fedor, deceased; and by Akhremenko, Galina T., administrator. Water treatment apparatus. 4,327,276, Cl. 219-121.00L.
Inland Steel Company: *See*—
Schwarz, Arthur M., 4,326,883, Cl. 75-5.000.
Innerspace Corporation: *See*—
Gongwer, Calvin A., 4,326,554, Cl. 137-14.000.
Innocenti Santeustacchio S.p.A.: *See*—
Nessi, Aurindo, 4,326,829, Cl. 414-357.000.
Innova, Inc.: *See*—
Moeglich, Karl, 4,326,935, Cl. 204-180.00P.
Inoshita, Yasushi: *See*—
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Inoue, Kenichi, to Daiwa Can Company, Ltd. Apparatus for reverse redrawing. 4,326,401, Cl. 72-350.000.
Inouye, Ken; Kono, Masao; Yoshida, Nobuo; Nakamura, Masuhisa; Okabayashi, Tadashi; and Igano, Ken'ichi, to Shionogi & Co., Ltd. Tyrosylated proinsulin C-peptide derivatives. 4,327,072, Cl. 424-1.000.
Institut de Recherche de l'Hydro-Quebec: *See*—
Missout, Gilles; Lalonde, Francois; and Cloutier, Marius, 4,327,335, Cl. 331-1.00A.
Instrumentation Laboratory Inc.: *See*—
Smith, Stanley B., Jr.; Schleicher, Robert G.; and Dennison, Allan G., 4,326,802, Cl. 356-316.000.
Instytut Odlewnictwa: *See*—
Pajak, Andrzej; Olszowski, Tadeusz; Mazur, Antoni, deceased; Holtzer, Mariusz; Marzencki, Andrzej; and Jachowicz, Adam, 4,326,578, Cl. 164-15.000.
International Business Machines: *See*—
Gregory, Floyd A.; Manning, Donald F.; Oranchak, William; and Student, Joseph J., deceased, 4,326,656, Cl. 226-59.000.
International Business Machines Corporation: *See*—
Champion, James R.; Ernst, Larry M.; Ford, Leland W.; and Velarde, Ronald G., 4,326,796, Cl. 355-14.0CH.
Darrow, Berwin W.; and Wilkinson, David J., 4,326,603, Cl. 184-6.100.
Kenney, Donald M., 4,326,332, Cl. 29-571.000.
Pipkin, David J., 4,327,130, Cl. 427-209.000.
Schaffer, Robert R.; and Skinner, Dean W., 4,326,814, Cl. 400-125.100.
Wanek, Donald J., 4,327,388, Cl. 360-104.000.
Wu, Philip T., 4,327,424, Cl. 365-104.000.
International Flavors & Fragrances Inc.: *See*—
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,326,998, Cl. 252-522.00R.
International Minerals & Chemical Corp.: *See*—
Wolfrom, Glen W.; Williams, Robert D.; Peeler, Herbert T.; and Ivy, Richard E., 4,326,523, Cl. 128-260.000.
International Telephone and Telegraph Corporation: *See*—
Brancaleone, Salvatore T., 4,326,765, Cl. 339-17.0CF.
Ranghelli, Joseph C., 4,327,330, Cl. 330-56.000.
Interox: *See*—
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Irving, Christopher L.: *See*—
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Isenschmid, Roland: *See*—
Banziger, Robert; Isenschmid, Roland; Menth, Anton; Muller, Rene; and Stucki, Samuel, 4,326,943, Cl. 204-290.00F.
Ishibe, Nobuyuki: *See*—
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Ishida, Hiroshi: *See*—
Kawada, Shigeki; Ishida, Hiroshi; and Koiwai, Yutaka, 4,327,315, Cl. 318-811.000.
Ishihara Sangyo Kaisha Ltd.: *See*—
Haga, Takahiro; Toki, Tadaaki; Koyanagi, Toru; and Imai, Osamu, 4,327,089, Cl. 424-200.000.
Ishikawa, Eizi; Matsuura, Ryouichi; and Yano, Kiyotosi, to Nippondenso Co., Ltd. Solenoid valve. 4,326,696, Cl. 251-129.000.
Ishikawa, Yukio: *See*—
Iwao, Takayuki; Ono, Takemitsu; and Ishikawa, Yukio, 4,326,459, Cl. 101-93.300.
Ishitsuka, Hideo: *See*—
Shinma, Nobuo; Umeda, Isao; Ishitsuka, Hideo; and Suhara, Yasuji, 4,327,088, Cl. 424-180.000.
Ishizaka, Sunao: *See*—
Ohmori, Sachio; Fukino, Kunihiro; and Ishizaka, Sunao, 4,326,788, Cl. 354-286.000.
Isogai, Nobuo; Hosokawa, Motoyuki; Okawa, Takashi; and Wakui, Natsuko, to Mitsubishi Gas Chemical Co., Inc. Process for producing 2-pentenoic ester. 4,327,225, Cl. 560-205.000.
Itaya, Nobushige: *See*—
Mizutani, Toshio; Itaya, Nobushige; Ohno, Nobuo; Matsuo, Takashi; Kitamura, Shigeyoshi; and Okuno, Yositosi, 4,327,109, Cl. 424-275.000.
Ito, Hiroshi; and Tanaka, Haruyuki, to Bandai Industry Co., Ltd. Simulated baseball game device. 4,326,715, Cl. 273-88.000.
Itoh, Hiroshi: *See*—
Ozu, Masao; Morita, Keiichi; and Itoh, Hiroshi, 4,326,868, Cl. 62-324.600.
ITT Industries, Inc.: *See*—
Botz, Jakob; Feger, Rolf; Mutschler, Erich; Spazierer, Hubert; and Weber, Adam, 4,327,264, Cl. 200-295.000.
Klein, Hans-Christof, 4,327,414, Cl. 364-426.000.
Ivy, Richard E.: *See*—
Wolfrom, Glen W.; Williams, Robert D.; Peeler, Herbert T.; and Ivy, Richard E., 4,326,523, Cl. 128-260.000.
Iwahori, Hiroshi; and Matsumoto, Shigetoshi, to Nitto Electric Industrial Company Ltd. Tubular permselective membrane module and method. 4,326,960, Cl. 210-650.000.
Iwai, Tadashi; Mizuno, Hisayuki; and Miura, Masao, to UBE Industries, Ltd. Process for producing chloride of elements of Group III, IV or V of Periodic Table. 4,327,062, Cl. 423-292.000.
Iwami, Naoki: *See*—
Tajima, Hatsuo; Iwami, Naoki; Masuda, Shunichi; Shimizu, Katsuichi; Kawatsura, Yoshihiro; Suzuki, Koji; and Yokomizo, Yoshikazu, 4,326,795, Cl. 355-14.00E.
Iwamoto, Seigo; and Saito, Eiichi, to Nihonshikizai Kogyo Co., Ltd.; and Takeda Chemical Industries, Ltd., part interest to each. Improving agent of chroma and brightness for pigments. 4,327,017, Cl. 260-105.000.
Iwao, Takayuki; Ono, Takemitsu; and Ishikawa, Yukio, to Mitsumi Electric Co., Ltd. Hammer lock releasing mechanism for a printing device. 4,326,459, Cl. 101-93.300.
J. M. Voith, GmbH: *See*—
Flaig, Heinrich; and Wolf, Karl, 4,326,916, Cl. 162-344.000.
Jachowicz, Adam: *See*—
Pajak, Andrzej; Olszowski, Tadeusz; Mazur, Antoni, deceased; Holtzer, Mariusz; Marzencki, Andrzej; and Jachowicz, Adam, 4,326,578, Cl. 164-15.000.
Jackson, Winston J., Jr.; and Darnell, William R., to Eastman Kodak Co. Process for preparing poly-1,4-cyclohexanedicarboxylate polyesters having high trans isomer content. 4,327,206, Cl. 528-179.000.
Jacobs, James K.: *See*—
Das Gupta, Sankar; Jacobs, James K.; and Mohanta, Samaresh, 4,326,938, Cl. 204-228.000.
Jacobsen, Jon E., to Siemens-Allis, Inc. Rotor assembly for a dynamoelectric machine. 4,327,303, Cl. 310-261.000.
Jaeggi, Knut A.: *See*—
Sele, Alex; Ferrini, Pier G.; Haas, Georges; Jaeggi, Knut A.; and Rossi, Alberto, 4,327,091, Cl. 424-246.000.
Jager, Wolfgang; and Boettger, Erhard, to Ebo-Jager, Inc. Aquarium immersion heater with dry operation prevention thermostatic switch. 4,327,281, Cl. 219-523.000.
James Brown & Sons, Ltd.: *See*—
Widmer, Colin F., 4,326,770, Cl. 339-278.00C.
James David Mfg. Corp.: *See*—
Clyburn, C. Wayne, 4,326,687, Cl. 248-168.000.
James, Roger T. Hang-rack assembly. 4,326,637, Cl. 211-175.000.
Janser, Herbert: *See*—
Ewertowski, Norbert; and Janser, Herbert, 4,326,624, Cl. 198-370.000.
Janson, Gunnar H., to Dana Corporation. Magnetic clutch housing. 4,327,301, Cl. 310-104.000.
Jaqua, Vance W., to Rockwell International Corporation. Injection shut-off valve for regenerative injection. 4,326,377, Cl. 60-247.000.
Jardin, Albert C. Solar furnace. 4,326,501, Cl. 126-430.000.
Jautelat, Manfred; Arlt, Dieter; Lantzsch, Reinhard; Fuchs, Rainer; Riebel, Hans-Jochem; Schroder, Rolf; and Harnisch, Horst, to Bayer Aktiengesellschaft. Preparation of styryl-cyclopropane-carboxylic acid esters and intermediate therefor. 4,327,025, Cl. 260-338.000.
Jean Walterscheid GmbH: *See*—
Geisthoff, Hubert; and Nienhaus, Clemens, 4,326,392, Cl. 64-3.000.
Jelalian, Albert V.: *See*—
Keene, Wayne H.; and Jelalian, Albert V., 4,326,799, Cl. 356-152.000.
Jenkins, Roy H.: *See*—
Gundersen, Ray S.; Colledge, Ronald J.; Jenkins, Roy H.; and Crook, Michael, 4,326,425, Cl. 73-863.530.
Jensen, Ronald N., to United States of America, National Aeronautics and Space Administration. Solar engine. 4,326,381, Cl. 60-641.140.
Jerrim, John W., to Sangamo Weston, Inc. Temperature compensation system for Hall effect element. 4,327,416, Cl. 364-481.000.
JLG Industries, Inc.: *See*—
Grove, John L.; and Kuhne, Frederick W., 4,326,601, Cl. 182-2.000.
Joerns Furniture Company: *See*—
Houlberg, Don M., 4,326,613, Cl. 192-21.000.
John Wyeth & Brother Limited: *See*—
Crossley, Roger, 4,327,102, Cl. 424-263.000.
Johnson, Marvin M.: *See*—
Nowack, Gerhard P.; and Johnson, Marvin M., 4,327,234, Cl. 585-267.000.
Johnson, Russell W.: *See*—
Flagg, John F.; Johnson, Russell W.; and Gatsis, John G., 4,326,945, Cl. 208-8.0LE.
Johnson, Steven A.; and Seader, Junior D., to University of Utah. Inert-gas stripping and distillation apparatus. 4,327,184, Cl. 435-287.000.
Jones, Addison B., to Rockwell International Corporation. Repeatable method for sloping walls of thin film material. 4,326,936, Cl. 204-192.00E.

Jones, Glen D.: *See*—
Kadakia, Vinod K.; Jones, Glen D.; Parikh, Kedar D.; and Rider, Ronald E., 4,327,379, Cl. 358-261.000.
Jones, Robert L.; Volgenau, Lewis; and Davis, Philip S., to Betz Laboratories, Inc. Sulfur-containing lignins as magnesium sulfite trihydrate dispersants. 4,326,962, Cl. 210-698.000.
Jones, Steven D.; and Blomgren, George E., to Union Carbide Corporation. Non-aqueous electrochemical cell. 4,327,159, Cl. 429-101.000.
Jones, Steven D.; and Blomgren, George E., to Union Carbide Corporation. Non-aqueous cell. 4,327,160, Cl. 429-101.000.
Jorg, Manfred. Spark circuit. 4,327,310, Cl. 315-209.00R.
Jousson, Pierre-Jean: *See*—
Moret, Michel-Antoine; and Jousson, Pierre-Jean, 4,326,314, Cl. 15-22.00R.
Juery, Gerard: *See*—
Vignaud, Jean-Claude; and Juery, Gerard, 4,327,260, Cl. 200-50.00C.
Jung, Johann: *See*—
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Junge, Johannes: *See*—
Murzin, Horst; Woss, Rainer; Burghoff, Hans; Schmieder, Frank; Herzig, Alfred; Junge, Johannes; and Deckarm, Gunter, 4,326,625, Cl. 198-653.000.
Kabushiki Kaisha Kohjin: *See*—
Kazutoyo, Yahiro, 4,326,877, Cl. 71-92.000.
Kabushiki Kaisha Morita Seisakusho: *See*—
Hotta, Mitsuhiko; Tachibana, Akifumi; and Shigihara, Takanori, 4,327,427, Cl. 367-118.000.
Sugai, Hiroshi; and Nakayama, Shoji, 4,326,846, Cl. 433-132.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Banda, Shunji, 4,326,776, Cl. 350-336.000.
Kadakia, Vinod K.; Jones, Glen D.; Parikh, Kedar D.; and Rider, Ronald E., to Xerox Corporation. Hardware implementation of 4-pixel code encoder. 4,327,379, Cl. 358-261.000.
Kahn, David A., to Negretti & Zambra (Aviation) Limited. Pyrometer system using separated spectral components from a heat source. 4,326,798, Cl. 356-45.000.
Kaiho, Mamoru: *See*—
Kato, Tsutomu; and Kaiho, Mamoru, 4,326,857, Cl. 48-210.000.
Kaiser, Carl: *See*—
Holden, Kenneth G.; Kaiser, Carl; and Weinstock, Joseph, 4,327,023, Cl. 260-239.0BB.
Kaiser Steel Corporation: *See*—
Hayden, Ralph P., Jr.; and Barksdale, Joe M., 4,326,701, Cl. 266-225.000.
Kakuichi Company Ltd.: *See*—
Tanaka, Kenichi, 4,326,905, Cl. 156-149.000.
Kakumoto, Susumu: *See*—
Kohara, Rikusei; Kakumoto, Susumu; Aoyama, Takashi; Shoji, Masami; and Shinagawa, Mutsuaki, 4,326,777, Cl. 350-357.000.
Kamata, Shigeru: *See*—
Aoyagi, Masao; and Kamata, Shigeru, 4,326,789, Cl. 354-286.000.
Kamijo, Eiji; Murakami, Kazuhito; and Tani, Katsuto, to Sumitomo Electric Industries, Ltd. Process for continuous production of porous metal. 4,326,931, Cl. 204-22.000.
Kan, Yasuhito: *See*—
Miyamoto, Koichi; Kan, Yasuhito; Nitanda, Hiroshi; and Ariga, Masao, 4,326,797, Cl. 355-57.000.
Kanebo Ltd.: *See*—
Kawahara, Haruyuki; Makita, Teruo; Kudo, Shozo; and Funakoshi, Takashi, 4,327,014, Cl. 523-116.000.
Kanekiyo, Hiroshi: *See*—
Fujiwara, Kiyoshi; Nagatomo, Katsuaki; Yoshinaga, Shoji; Tamura, Zensuke; Shibata, Fumio; and Kanekiyo, Hiroshi, 4,326,666, Cl. 233-15.000.
Kaneko, Katsumi: *See*—
Okumura, Yoshiharu; Furukawa, Hiroshi; and Kaneko, Katsumi, 4,327,231, Cl. 568-899.000.
Kankaanpaa, Matti, to Valmet Oy. Method and apparatus for calendering paper webs or the like. 4,326,456, Cl. 100-41.000.
Kanoh, Chiyuki. Airtightness testing apparatus for watches. 4,326,408, Cl. 73-49.300.
Kaplan, Neil, to Hi-Tech Industries, Inc. Encapsulating moisture-proof coating. 4,327,369, Cl. 357-72.000.
Kaplan, Norman C., to Calcol, Inc. Composition of matter. 4,327,028, Cl. 260-345.300.
Kaplow, Roy; and Russo, Carl J., to Massachusetts Institute of Technology. Method for forming material surfaces. 4,326,898, Cl. 148-16.600.
Kapp, Ludwig J., to Ziyad Incorporated. Paper feeding apparatus and method for printing apparatus. 4,326,815, Cl. 400-625.000.
Karas, Nicholas V., to United States of America, Air Force. Physical deterrent barrier with upward looking detection sensor for intruder detection system. 4,327,358, Cl. 340-541.000.
Karatsu, Yoshinori: *See*—
Kita, Hisanao; Karatsu, Yoshinori; Nakazaki, Takamitsu; and Akutsu, Yoji, 4,327,273, Cl. 219-121.0EC.
Karl M. Reich, Maschinenfabrik GmbH: *See*—
Maurer, Werner; and Farian, Gerhard, 4,326,661, Cl. 227-120.000.
Karsten, Robert W.: *See*—
Ripley, Robert H.; Karsten, Robert W.; Brandon, Eugene M.; and Lockerby, James W., 4,327,011, Cl. 524-474.000.
Kartavenko, Alexandre: *See*—
Capostagno, Joseph A.; Chan, Kingsley; and Kartavenko, Alexandre, 4,327,403, Cl. 362-306.000.
Kato, Kunio; Sugiyama, Yoshiki; and Enomoto, Ryo, to Ibigawa Electric Industry Co., Ltd. Method for refining metal carbides containing free carbon. 4,327,067, Cl. 423-345.000.
Kato, Tsutomu; and Kaiho, Mamoru, to Director-General of Agency of Industrial Science and Technology. Production of a gas of a high heating value from coal. 4,326,857, Cl. 48-210.000.
Kato, Yasuyuki; Suzuki, Haruo; Kondo, Masatsune; Sugimoto, Hiroaki; Kimura, Junichi; and Saito, Zyunso, to Sumitomo Chemical Company, Limited. Bulk Polycondensation process for producing aromatic polyesters. 4,327,205, Cl. 528-128.000.
Katoh, Tsuneyuki; Hiraga, Keishiro; Seki, Junji; and Suzuki, Makoto, to Asahi Kasei Kogyo Kabushiki Kaisha. Extruded rigid thermoplastic sheet having optically smooth surfaces. 4,327,149, Cl. 428-332.000.
Katsuki, Kanji: *See*—
Hosokawa, Yasuhiko; Katsuki, Kanji; and Suzuki, Toshio, 4,327,314, Cl. 318-722.000.
Kauer, Harald; Overlach, Knud; and Wilken, Joachim, to Dr.-Ing. Ludwig Pietzsch. Device for the positioning and position stabilization of an inert mass, positioned with mobility on a base. 4,326,447, Cl. 89-41.00H.
Kawabata, Ichiro. Vibratile mat. 4,326,506, Cl. 128-33.000.
Kawada, Shigeki; Ishida, Hiroshi; and Koiwai, Yutaka, to Fujitsu Fanuc Limited. Induction motor drive apparatus. 4,327,315, Cl. 318-811.000.
Kawahara, Haruyuki; Makita, Teruo; Kudo, Shozo; and Funakoshi, Takashi, to Kanebo Ltd. Resin-forming material, implant material and compositions for restorative material suitable for medical or dental use. 4,327,014, Cl. 523-116.000.
Kawahara, Hiroshi; and Yasuda, Tetsuro, to Asahi Glass Company, Ltd. Permselective membrane. 4,326,958, Cl. 210-500.200.
Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph; and Deutsch, Leslie J., 4,327,419, Cl. 364-717.000.
Kawakami, Moriatsu, to Laurel Bank Machine Co., Ltd. Apparatus for processing sheets. 4,326,636, Cl. 209-534.000.
Kawamura, Kunio; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Interchangeable objective lens single-lens reflex camera focusing device. 4,326,783, Cl. 354-25.000.
Kawasaki, Masasuke. Movable skeg for non-propelled barges. 4,326,479, Cl. 114-248.000.
Kawasaki Seitetsu Kabushiki Kaisha: *See*—
Akimoto, Keiichi; and Tsuchida, Tsuyoshi, 4,326,337, Cl. 33-174.0PA.
Kawashima, Hatsuo: *See*—
Mochida, Haruo; and Kawashima, Hatsuo, 4,326,616, Cl. 192-111.00A.
Kawashima, Kenichi; Horibe, Kiyoshi; and Degawa, Takashi, to Hitachi, Ltd. Swash plate type compressor for use in air-conditioning system for vehicles. 4,326,838, Cl. 417-269.000.
Kawatsura, Yoshihiro: *See*—
Tajima, Hatsuo; Iwami, Naoki; Masuda, Shunichi; Shimizu, Katsuichi; Kawatsura, Yoshihiro; Suzuki, Koji; and Yokomizo, Yoshikazu, 4,326,795, Cl. 355-14.00E.
Kazutoyo, Yahiro, to Kabushiki Kaisha Kohjin. Method of stimulating grass root growth with 6-benzylaminopurine. 4,326,877, Cl. 71-92.000.
Keene, Wayne H.; and Jelrlian, Albert V., to Raytheon Company. Active-passive scanning system. 4,326,799, Cl. 356-152.000.
Kelly, Joseph J., Jr.; and Rambo, George E., to Babcock & Wilcox Company, The. Method of nuclear reactor control using a variable temperature load dependent set point. 4,326,917, Cl. 376-216.000.
Kelso, Charles R.; and Mayer, Endre A., to Bendix Corporation, The. Solenoid having a multi-piece armature. 4,327,345, Cl. 335-265.000.
KemaNord AB: *See*—
Westerlund, Sture, 4,326,941, Cl. 204-268.000.
Kemps, Josephus M. A.: *See*—
Froling, Albert; de Jongh, Rudolph O.; and Kemps, Josephus M. A., 4,326,932, Cl. 204-59.00R.
Kendall Company, The: *See*—
Rappleyea, Frederick A., 4,326,303, Cl. 2-411.000.
Kennametal Inc.: *See*—
Stephenson, Earle W., 4,326,592, Cl. 172-123.000.
Kennecott Corporation: *See*—
Long, William W., III, 4,326,744, Cl. 294-81.00R.
Murata, Yorihiro; and Weber, Gary W., 4,327,186, Cl. 501-92.000.
Kennedy, Joseph P.; and Frisch, Kurt C., Jr., to University of Akron, The. Cationically polymerizable macromolecular monomers and graft copolymers therefrom. 4,327,201, Cl. 526-131.000.
Kenney, Donald M., to International Business Machines Corp. Method of making a high density V-MOS memory array. 4,326,332, Cl. 29-571.000.
Kerr-McGee Chemical Corporation: *See*—
Hermann, John A.; and Lucid, Michael F., 4,327,061, Cl. 423-8.000.
Kessler, Sebastian W., Jr., to RCA Corporation. Resilient contact ring for providing a low impedance connection to the base region of a semiconductor device. 4,327,370, Cl. 357-79.000.
Khokhlov, Valentin I.: *See*—
Injushin, Viktor M.; Khokhlov, Valentin I.; Akhremenko, Fedor, deceased; and Akhremenko, Galina T., administrator, 4,327,276, Cl. 219-121.00L.
Khromov, Vladimir I.: *See*—
Davydov, Vadim A.; Khromov, Vladimir I.; Makeev, Igor M.; Kogos, Aizik M.; and Rymarenko, Leonid I., 4,326,400, Cl. 72-280.000.
Kieber, Lothar, to Deutsche Calypsolgesellschaft mbH & Co. Holding device for holding a dispenser container. 4,326,648, Cl. 222-162.000.
Kiehl, Arthur H. Golf swing training and exercising device. 4,326,718, Cl. 273-183.00B.

Kiehs, Karl: *See*—
Buerstinghaus, Rainer; Kiehs, Karl; Siegel, Hardo; and Adolphi, Heinrich, 4,327,090, Cl. 424-203.000.
Kiesbye, Peter: *See*—
Moebus, Otto; Teuber, Michael; and Kiesbye, Peter, 4,327,179, Cl. 435-42.000.
Kigawa, Teruo, to Tokyo Shibaura Electric Co., Ltd. Sewing control system for multiple-pattern sewing machine. 4,326,473, Cl. 112-158.00E.
Kim, Dae Sik. Portable thermo-anemometer with bimetallic sensor. 4,326,780, Cl. 340-594.000.
Kimberly-Clark Corporation: *See*—
Ryan, Lenore S.; Murray, Frank C.; Sprangers, Ann M.; Santoski, William J.; Sciaraffa, Michael A.; Abel, Kent W.; and Donnelly, Harold F., 4,326,528, Cl. 128-287.000.
Wollangk, Edward G.; and Lilaonitkul, Amnuey, 4,326,527, Cl. 128-285.000.
Kime, Robert W., to Cornell Research Foundation, Inc. Clarification of fruit juice with honey. 4,327,115, Cl. 426-12.000.
Kimmel, Spurgeon E.: *See*—
Ballerstein, George B.; and Kimmel, Spurgeon E., 4,326,438, Cl. 82-53.100.
Kimura, Atsuyoshi: *See*—
Abeyama, Shozo; Saito, Makoto; Kimura, Atsuyoshi; and Nakamura, Sadayuki, 4,326,886, Cl. 75-129.000.
Kimura, Junichi: *See*—
Kato, Yasuyuki; Suzuki, Haruo; Kondo, Masatsune; Sugimoto, Hiroaki; Kimura, Junichi; and Saito, Zyunso, 4,327,205, Cl. 528-128.000.
Kincaid, John W., to Belden Corporation. Electric cables with improved shielding members. 4,327,246, Cl. 174-36.000.
Kinch, Michael A.: *See*—
Chapman, Richard A.; Kinch, Michael A ; and Hynecek, Jaroslav, 4,327,291, Cl. 250-332.000.
King, Don G. Method for operating a panoramic optical system. 4,326,775, Cl. 350-320.000.
King, Don G.; and Bennett, Bill B. Circular raster sweep generator. 4,327,312, Cl. 315-378.000.
King, Paul V.; Becher, Albert F.; and Henderson, Wilmer P., to United States of America, Army. Blast suppressive shielding. 4,326,468, Cl. 109-49.500.
Kinjo, Hisao: *See*—
Wada, Yoshiyo; Kinjo, Hisao; and Ueno, Ichiro, 4,327,430, Cl. 369-43.000.
Kishi, Norimasa, to Nissan Motor Co., Ltd. High speed information selection and transfer system. 4,327,418, Cl. 364-715.000.
Kissell, Ronald E., to Owens-Corning Fiberglas Corporation. Method and apparatus for curing fibrous mineral material. 4,326,844, Cl. 432-13.000.
Kita, Hisanao; Karatsu, Yoshinori; Nakazaki, Takamitsu; and Akutsu, Yoji, to Hitachi, Ltd. Method of treating a workpiece with electron beams and apparatus therefor. 4,327,273, Cl. 219-121.0EC.
Kita, Toru: *See*—
Kobayashi, Hiroshi; Kita, Toru; and Fujishiro, Takeshi, 4,326,412, Cl. 73-204.000.
Kobayashi, Hiroshi; and Kita, Toru, 4,326,422, Cl. 73-861.220.
Kitagawa, Fumio; and Ichinomiya, Tsutomu, to Matsushita Electric Works, Ltd. Sphygmomanometer. 4,326,536, Cl. 128-682.000.
Kitamura, Shigeyoshi: *See*—
Mizutani, Toshio; Itaya, Nobushige; Ohno, Nobuo; Matsuo, Takashi; Kitamura, Shigeyoshi; and Okuno, Yositosi, 4,327,109, Cl. 424-275.000.
Kitamura, Takehiko: *See*—
Shigeyasu, Motoo; and Kitamura, Takehiko, 4,327,226, Cl. 562-416.000.
Klawitter, Jerome J., to Hemex, Inc. Heart valve with pivoted occluder. 4,326,304, Cl. 3-1.500.
Klein, Hans-Christof, to ITT Industries, Inc. Vehicle brake system. 4,327,414, Cl. 364-426.000.
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., to International Flavors & Fragrances Inc. Methyl substituted norbornane carboxaldehydes perfume compositions. 4,326,998, Cl. 252-522.00R.
Klingenberg, Hans U. Watchcase. 4,327,429, Cl. 368-294.000.
Klotz, Marvin R., to Standard Oil Company (Indiana). Hydrocarbon-conversion catalyst and its method of preparation. 4,327,236, Cl. 585-481.000.
Kludas, Martin: *See*—
Charlet, Egbert; and Kludas, Martin, 4,327,078, Cl. 424-45.000.
Knight, George W.: *See*—
Allen, James A.; Knight, George W.; and Edmondson, Morris S., 4,327,009, Cl. 524-114.000.
Knirsch, Franco: *See*—
Pasini, Arnaldo; and Knirsch, Franco, 4,326,812, Cl. 400-121.000.
Kobayashi, Hidetoshi: *See*—
Toda, Yuzo; Kobayashi, Hidetoshi; and Koizumi, Junji, 4,327,175, Cl. 430-546.000.
Kobayashi, Hiroshi; Kita, Toru; and Fujishiro, Takeshi, to Nissan Motor Company, Limited. Flowmeter of hot wire type. 4,326,412, Cl. 73-204.000.
Kobayashi, Hiroshi; and Kita, Toru, to Nissan Motor Co. Probe unit of a fluid flow rate measuring apparatus. 4,326,422, Cl. 73-861.220.
Kobayashi, Masakazu: *See*—
Ueda, Ikuo; Kobayashi, Masakazu; Yamada, Hisashi; and Ono, Hiroki, 4,327,093, Cl. 424-246.000.
Kobayashi, Masateru: *See*—
Murakami, Masahiro; Kobayashi, Masateru; Sone, Takanori; and Shibuya, Chisei, 4,327,211, Cl. 544-27.000.
Kobayashi, Noboru: *See*—
Sakurai, Takeyoshi; and Kobayashi, Noboru, 4,327,263, Cl. 200-148.00A.
Kobayashi, Tetsuo: *See*—
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Kobelt, Jacob. Control device for marine gearbox and engine. 4,326,612, Cl. 192-0.096.
Kodama, Yutaka: *See*—
Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,327,097, Cl. 424-250.000.
Koenig, Karl-Heinz: *See*—
Hamprecht, Gerhard; Parg, Adolf; and Koenig, Karl-Heinz, 4,327,034, Cl. 260-455.00A.
Koenig, Robert G., to Cleveland Machine Controls, Inc. Web tension transducer arrangement. 4,326,424, Cl. 73-862.480.
Kogos, Aizik M.: *See*—
Davydov, Vadim A.; Khromov, Vladimir I.; Makeev, Igor M.; Kogos, Aizik M.; and Rymarenko, Leonid I., 4,326,400, Cl. 72-280.000.
Kohara, Rikuo; Kakumoto, Susumu; Aoyama, Takashi; Shoji, Masami; and Shinagawa, Mutsuaki, to Matsushita Electric Industrial Co., Ltd. Electrochromic display device. 4,326,777, Cl. 350-357.000.
Kohda, Kazuo, to Victor Company of Japan, Ltd. Cassette type tape recorder. 4,327,389, Cl. 360-105.000.
Koide, Hiroshi: *See*—
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Reed, Kingstone L. H.; and Hatcher, Ian, 4,326,383, Cl. 62-3.000.
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Hagino, Hiroshi; Odagiri, Hideo; and Okutani, Junichi, 4,327,042, Cl. 261-77.000.

L.S. Starrett Company, The: *See*—
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La Cellophane: *See*—
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La Telemecanique Electrique: *See*—
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LaCoste, Francois R., to Patentex, S.A. Polyurethane golf club. 4,326,716, Cl. 273-167.00R.

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Haag, Werner O.; and Lago, Rudolph M., 4,326,994, Cl. 252-455.00Z.

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Landa, Benzion, to Savin Corporation. Sawtooth feeder with jam preventer. 4,326,644, Cl. 221-263.000.

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Lang, Frank B.; and Clemens, Jon K., to RCA Corporation. Video disc player with RFI reduction circuit. 4,327,432, Cl. 369-126.000.

Lang, Frank B.: *See*—
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Lange, Wolfgang: *See*—
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Lapides, Melvin E., to Electric Power Research Institute, Inc. Storage assembly for spent nuclear fuel. 4,326,918, Cl. 376-272.000.

Larkin, Sam. Disposable waste receptacle. 4,326,575, Cl. 150-50.000.

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Lasermann, Franz; and Wittenbreder, Eduard, to Droop, Firma; and Herr Dipl.-Ing. M. G. Dronsek. Process for longitudinal adjustment of tools. 4,326,824, Cl. 409-132.000.

Laszlo, Tibor S.; Nienow, John F.; Sherwood, John F.; and Irving, Christopher L., to Philip Morris Incorporated. Firmness control in a cigarette maker. 4,326,542, Cl. 131-280.000.

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Laugesen, Thomas C., to NWL Transformers. Ripple insensitive electric precipitators. 4,326,860, Cl. 55-105.000.

Laurel Bank Machine Co., Ltd.: *See*—
Kawakami, Moriatsu, 4,326,636, Cl. 209-534.000.

Lavery, Lawrence P.; Wilcox, David G.; and Thomas, Dale C., to Xerox Corporation. Automatic development dispenser control. 4,326,646, Cl. 222-56.000.

Laviron, Michel: *See*—
LePage, Joel; Laviron, Michel; and Derewonko, Henri, 4,326,330, Cl. 29-571.000.

Lawhon, William T., Jr.: *See*—
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Lawrence, Anthony W., to Northrop Corporation. Thin film laser gyro. 4,326,803, Cl. 356-350.000.

Lawrence, Robert H., Jr.; and Hill, Phillip E., to Agrigenetics Research Associates Limited. Hybrids. 4,326,358, Cl. 47-58.000.

Lawson, Paul: *See*—
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Lazarus, Stanley D., to Allied Chemical Corporation. Production of thermally stabilized polyester with alkylene carbonates and sodium or potassium iodide. 4,327,207, Cl. 525-439.000.

Le Materiel Telephonique Thomson-CSF: *See*—
Athenes, Claude; Salle, Jacques E.; and Blouin, Philippe, 4,327,442, Cl. 375-119.000.

Lechner, Robert, to Siemens Aktiengesellschaft. Circuit arrangement for consecutively monitoring operating conditions of direct current devices. 4,327,253, Cl. 179-18.0FG.

Leclerc, Jean F., to Service d'Exploitation Industrielle des Tabacs et des Allumettes. Process and apparatus for providing data indicative of the shape of leaf-like article. 4,327,375, Cl. 358-107.000.

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White, William T.; Clemons, Johnny M.; and Ledbetter, Frank E., III, 4,327,150, Cl. 428-332.000.

Lee, Jiunn-Feng. Speed indicating apparatus for vehicles. 4,326,415, Cl. 73-499.000.

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Lee, John N.: *See*—
Berg, Norman J.; Casseday, Michael W.; Lee, John N.; and Abramovitz, Irwin J., 4,326,778, Cl. 350-358.000.

Leeds, Harry D.: *See*—
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Leger, Violeta Z., to Union Carbide Corporation. Nonaqueous cell having a MNO_2/poly-carbon fluoride cathode. 4,327,166, Cl. 429-194.000.
Lehmann, Ernesto, to Georg Fischer Aktiengesellschaft. Tube coupling assembly. 4,326,737, Cl. 285-112.000.
Lehr, Gunter; Hucks, Uwe; Vernaleken, Hugo; Nielinger, Werner; and Tresper, Erhard, to Bayer Aktiengesellschaft. Continuous process for the hydrolytic production of polycaprolactam having a low-monomer and low-dimer content. 4,327,208, Cl. 528-323.000.
Leibrand, John G., Sr.; and Bessey, Marlin L., to Runfree Enterprise, Inc. Method and apparatus for preheating fuel. 4,326,492, Cl. 123-557.000.
Leitner, Wolfgang; Pampouchidis, Georg; and Bleikolm, Anton, to Vianova Kunstharz, A.G. Water-dilutable oxazolidine group containing epoxy resin esters, coating compositions prepared therefrom, and their use as cathodically depositable paints. 4,327,200, Cl. 525-531.000.
Lejon, Jean, to Controle Bailey. Electronic regulation procedures using a servomotor. 4,326,448, Cl. 91-363.00R.
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Lenack, Roger D.; and Lenack, Isidore J., deceased, 4,327,117, Cl. 426-88.000.
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Lenack, Roger D.; and Lenack, Isidore J., deceased, 4,327,117, Cl. 426-88.000.
Lenack, Roger D.; and Lenack, Isidore J., deceased (by Lenack, Nellie S., executrix). Thaw indicator for frozen foods. 4,327,117, Cl. 426-88.000.
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Leonhardt, Fritz; Andra, Wolfhart; Zellner, Wilhelm; Schlaich, Jorg; and Mayr, Gunter. Waisted envelope for tubular building structures. 4,326,363, Cl. 52-80.000.
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Moret, Michel-Antoine; and Jousson, Pierre-Jean, 4,326,314, Cl. 15-22.00R.
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Teixeira, Manuel G.; and Valois, Rene J., 4,326,564, Cl. 139-370.200.
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Leva, Max. Tower packing element. 4,327,043, Cl. 261-94.000.
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Bus, Jan; Mohlmann, Willem M. M.; and Pritchard, Norman J., 4,326,979, Cl. 252-158.000.
Froling, Albert; de Jongh, Rudolph O.; and Kemps, Josephus M. A., 4,326,932, Cl. 204-59.00R.
Mazzola, Louis R., 4,327,151, Cl. 428-407.000.
Melville, James B., 4,326,967, Cl. 252-8.800.
Rudy, Jerome; and Rapisarda, Anthony A., 4,327,133, Cl. 427-242.000.
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Levine, Aaron W.; Tomeczek, Kazimiera D.; and Harper, Stanley A., to RCA Corporation. Method of metallizing a phosphor screen. 4,327,123, Cl. 427-64.000.
Lew, Hyok S. Sealess pressurized mixing vessels. 4,326,811, Cl. 366-290.000.
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Gockler, Heinz; and Hofmeister, Hagen, 4,327,439, Cl. 375-67.000.
Lichtman, Sandra: *See*—
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Puglia, Wayne J.; Patanasinth, Kanit J.; Lombardo, Andrew T.; Beam, John E.; and Mackay, Donald A. M., 4,327,076, Cl. 424-38.000.
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Hao, Paul L. C.; Hsu, W. W.; Lin, W. S.; Tong, S. N.; Hung, H. K.; and Chang, M. C., 4,327,003, Cl. 523-336.000.
Lincoln, Edgar B. Positive opening device for pinch valve sleeves. 4,326,695, Cl. 251-7.000.
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Benkmann, Christian, 4,326,858, Cl. 55-26.000.
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Lips, Alexander; and Pratley, Stuart K., to Levers Brothers Company. Liquid fabric-softening composition. 4,326,965, Cl. 252-8.800.
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Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; Clarke, Donald A.; and Richards, Blaine, 4,326,808, Cl. 356-445.000.
Lis, Steven A.; Serreze, Harvey B.; and Sienkiewicz, Peter M., to Radiation Monitoring Devices, Inc. Method to synthesize and produce thin films by spray pyrolysis. 4,327,119, Cl. 427-74.000.
Litchfield, John H.; and Lawhon, William T., Jr., to Battelle Development Corporation. Aerobic submerged fermentation of sporulating, ectomycorrhizal fungi. 4,327,181, Cl. 435-176.000.
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Loomer, Weston R., 4,326,692, Cl. 248-488.000.
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Lloyd, Bert A. Music holder. 4,326,691, Cl. 248-443.000.
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Lockheed Corporation: *See*—
Miller, Robert N.; and Smith, Richard L., 4,327,152, Cl. 428-419.000.
Lockheed Missiles & Space Company, Inc.: *See*—
Weyers, Paul F. R., 4,327,296, Cl. 290-53.000.
Loftus, Barry N.; and Young, Hugh J. Door knobs and levers. 4,326,738, Cl. 292-172.000.
Logan, William R.; Sarot, Pierre; and Bouillet, Edmond, to Interox, BEX. Composition and process for washing and bleaching. 4,326,976, Cl. 252-99.000.
Lohse, Friedrich; Schmid, Rolf; and Fatzer, Willy, to Ciba-Geigy Corporation. Acicular aluminium salts of carboxylic acids and processes for their preparation. 4,327,032, Cl. 260-448.00R.
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Lomicka, Roy F., Jr.; and Heller, Peter N., to Digital Equipment Corporation. Dot matrix character printer control circuitry for variable pitch printing. 4,326,813, Cl. 400-124.000.
Long, William W., III, to Kennecott Corporation. Work hook device. 4,326,744, Cl. 294-81.00R.
Loomer, Weston R., to Litton Systems, Inc. Mirror bracket. 4,326,692, Cl. 248-488.000.
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L'Oreal: *See*—
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Lowe, David R.; and Hay, Gerard J., to Courtaulds Limited. Underpants. 4,326,302, Cl. 2-405.000.
Lowther, Frank E., to Purification Sciences, Inc. Internal combustion engine with oxidant manufacture. 4,326,483, Cl. 123-3.000.
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Chamberlin, William B., III, 4,326,972, Cl. 252-33.300.
Lucas, Edward J.: *See*—
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Luckenbach, David, to Hi-G Incorporated. Solenoid with mechanically latchable plunger. 4,327,344, Cl. 335-253.000.

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Lummus Company, The: *See*—
Gelbein, Abraham P., 4,327,219, Cl. 546-317.000.
Sze, Morgan C.; and Simone, Andre A., 4,326,853, Cl. 44-1.00F.

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Feinberg, Stewart C.; Lundsager, Christian B.; Lundquist, Joseph T., Jr.; and Balouskus, Robert A., 4,327,164, Cl. 429-144.000.

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Luning, Bjorn, to AB Bonnierforetagen. Synthetic antigenically-active polypeptide and a process for its preparation. 4,327,075, Cl. 424-12.000.

Lustig, Martin: *See*—
Bacino, Carl J.; and Lustig, Martin, 4,326,630, Cl. 206-315.00R.

Lynell Medical Technology, Inc.: *See*—
Poler, Stanley, 4,326,306, Cl. 3-13.000.

Lyu, Seung W.; and Misra, Surya K., to National Can Corporation. Method of making tin-layered stock material and containers therefrom. 4,326,896, Cl. 148-12.00D.

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Van Zijderveld, George J., 4,326,849, Cl. 474-161.000.

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Machlett Laboratories, Inc., The: *See*—
Weber, Richard G., 4,327,305, Cl. 313-330.000.

Mackay, Donald A. M.: *See*—
Puglia, Wayne J.; Patanasinth, Kanit J.; Lombardo, Andrew T.; Beam, John E.; and Mackay, Donald A. M., 4,327,076, Cl. 424-38.000.

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Magna Corporation: *See*—
Blair, Charles M., Jr., 4,326,968, Cl. 252-8.55D.
Blair, Charles M., Jr., 4,326,983, Cl. 252-358.000.
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Davydov, Vadim A.; Khromov, Vladimir I.; Makeev, Igor M.; Kogos, Aizik M.; and Rymarenko, Leonid I., 4,326,400, Cl. 72-280.000.

Makita, Teruo: *See*—
Kawahara, Haruyuki; Makita, Teruo; Kudo, Shozo; and Funakoshi, Takashi, 4,327,014, Cl. 523-116.000.

Malchow, Max E., to RCA Corporation. Circuit arrangement useful in developing decoupled operating voltages for IF amplifier stages of an integrated circuit. 4,327,332, Cl. 330-261.000.

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Carneim, Wilfried; Hillemanns, Herbert; Vollmecke, Hermann; Ribken, Hans; Schumacher, Heinz; and Roether, Kurt, 4,326,699, Cl. 266-114.000.

Manning, Donald F.: *See*—
Gregory, Floyd A.; Manning, Donald F.; Oranchak, William; and Student, Joseph J., deceased, 4,326,656, Cl. 226-59.000.

Manville Service Corporation: *See*—
Harris, Walter W., 4,326,871, Cl. 65-12.000.
Sadler, Thomas H., 4,326,891, Cl. 106-99.000.

Marakin, Vladimir I.: *See*—
Bukhtiyarov, Ivan D.; An, Viktor B.; Farshatov, Marat N.; Sapozhnikov, Fedor F.; Sidorov, Anatoly G.; Proskurina, Natalya A.; and Marakin, Vladimir I., 4,326,410, Cl. 73-117.300.

Maranhao, Luiz E. C. Individual bagasse drier. 4,326,470, Cl. 110-220.000.

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Smith, Edward H.; Dent, Thomas H.; and Marchese, Robert T., 4,326,317, Cl. 15-302.000.

Maresca, Louis M.: *See*—
Colon, Ismael; Maresca, Louis M.; and Kwiatkowski, George T., 4,326,989, Cl. 252-429.00R.

Margotte, Dieter: *See*—
Druschke, Frank; Margotte, Dieter; Cohnen, Wolfgang; and Idel, Karsten, 4,327,015, Cl. 524-162.000.

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Soriano G., Vicente; Marino A., Carmin; and Valdez, Enrique R., 4,326,884, Cl. 75-71.000.

Marino, Carlo. Device for locating center positions. 4,326,339, Cl. 33-191.000.

Marino, Samuel F.; and Hidding, Daniel P., to Hunt-Wesson Foods, Inc. Dust cover with assurance lug. 4,326,649, Cl. 222-182.000.

Mark, Harold W.; and Zuech, Ernest A., to Phillips Petroleum Company. Passivating agent composition and method for its preparation. 4,326,990, Cl. 252-431.00C.

Markert, Jurgen: *See*—
Liechti, Hans W.; Burdeska, Kurt; and Markert, Jurgen, 4,327,018, Cl. 260-156.000.

Markley, Donald D. Musical instrument string. 4,326,444, Cl. 84-297.00S.

Markwell, Roger E.: *See*—
Evans, John M.; and Markwell, Roger E., 4,327,099, Cl. 424-256.000.

Marley, William R. Cut log section holder for log splitting operation. 4,326,703, Cl. 269-156.000.

Marquest Medical Products, Inc.: *See*—
Bailey, Donald L.; and Williams, Charles, 4,326,540, Cl. 128-763.000.

Marsan, Arthur E. Appliance for the treatment of colostomy and the like. 4,326,521, Cl. 128-283.000.

Marsh, Frank D., to Du Pont de Nemours, E. I., and Company. Chlorination process. 4,327,036, Cl. 260-465.00G.

Marsili, Leonardo; Franceschi, Giovanni; and Sanfilippo, Aurora, to Farmitalia Carlo Erba S.p.A. 3-Amidino ansamycins. 4,327,096, Cl. 424-250.000.

Martin, Charles E.; and Rachwal, Ervin J., to Western Electric Company, Inc. Photographic image definition improvement. 4,327,172, Cl. 430-407.000.

Martin, John K., III: *See*—
Whitney, Douglass G.; and Martin, John K., III, 4,326,517, Cl. 128-214.00F.

Martin, Julian R.; and Sides, Larry W., to R. J. Reynolds Tobacco Company. Smoking product and process for manufacturing same. 4,326,543, Cl. 131-362.000.

Martin Marietta Corporation: *See*—
Zaczek, Thomas E., 4,327,417, Cl. 364-578.000.

Martin, Michael L.: *See*—
Gauthier, Charles F.; and Martin, Michael L., 4,326,587, Cl. 166-379.000.

Martin, Pierre, to Ciba-Geigy Corporation. Process for producing 2,3,5,6-tetrachloropyridine and 3,5,6-trichloropyridin-2-ol. 4,327,216, Cl. 546-250.000.

Martinez, Richard I.; and Herron, John T., to United States of America, Commerce. Method for producing carbocyclic compounds from cyclic sulfide. 4,327,233, Cl. 585-357.000.

Maruoka, Minekazu; and Hirotani, Tatsushi, to Fujitsu Limited. Control system for input/output apparatus. 4,327,409, Cl. 364-200.000.

Marvin Glass & Associates: *See*—
Breslow, Jeffrey D.; and Erickson, Erick E., 4,326,710, Cl. 273-1.00E.

Marzencki, Andrzej: *See*—
Pajak, Andrzej; Olszowski, Tadeusz; Mazur, Antoni, deceased; Holtzer, Mariusz; Marzencki, Andrzej; and Jachowicz, Adam, 4,326,578, Cl. 164-15.000.

Maschinenfabrik Carl Zangs Aktiengesellschaft: *See*—
Brock, Josef; and Surkamp, Paul, 4,326,563, Cl. 139-76.000.

Masi, Paolo: *See*—
Bernardi, Luigi; Masi, Paolo; Suarato, Antonino; and Arcamone, Federico, 4,327,029, Cl. 260-351.100.

Mason, Thomas A., to Western Publishing Company, Inc. Cardboard food tray and puppet device. 4,326,356, Cl. 46-154.000.

Massachusetts Institute of Technology: *See*—
Berte, Frank J., 4,326,475, Cl. 114-39.000.
Kaplow, Roy; and Russo, Carl J., 4,326,898, Cl. 148-16.600.
Wurtman, Richard J., 4,327,112, Cl. 424-319.000.

Massey, Roger G.; and Holloway, David G., to Parker & Harper Mfg. Co. Limit switch for rotary control device. 4,326,627, Cl. 200-47.000.

Masuda, Shunichi: *See*—
Tajima, Hatsuo; Iwami, Naoki; Masuda, Shunichi; Shimizu, Katsuichi; Kawatsura, Yoshihiro; Suzuki, Koji; and Yokomizo, Yoshikazu, 4,326,795, Cl. 355-14.00E.

Masuda, Takayoshi; Honjo, Masaru; Takase, Tsutomu; and Watanabe, Yoshimoto, to Mitsui Toatsu Chemicals, Inc. Method for purifying fatty acid esters of saccharide. 4,327,183, Cl. 435-274.000.

Matagrano, Theodore T. Disc caliper clutch with easy access and burnout proof rotor. 4,326,614, Cl. 192-70.130.

Matsuda, Akira; Yoshioka, Osamu; Takahashi, Katsutoshi; Yoshida, Kooichi; and Ninomiya, Hiroshi, to Nippon Kayaku Kabushiki Kaisha. Method of enhancing absorption of antitumor agent into gastrointestinal tumor site and orally administrable antitumor compositions therefor. 4,327,081, Cl. 424-81.000.

Matsuda, Yoshiteru; Tomimoto, Tetsuo; and Nagaoka, Yoshitomo, to Matsushita Electric Industrial Co., Ltd. Flesh correction circuit for a color television receiver. 4,327,374, Cl. 358-28.000.

Matsui, Hisanori; Tanaka, Hiroshi; Yabutani, Kunihiro; and Kurono, Hitoshi, to Nihon Nohyaku Co., Ltd. Process for producing 1,3-dithiol-2-ylidene malonates. 4,327,223, Cl. 549-39.000.

Matsui, Ryo; Matsushika, Tadao; Hayashi, Yoshio; and Shiga, Tetsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Dry image forming material. 4,327,176, Cl. 430-619.000.

Matsuki, Yutaka: *See*—
Hoki, Tsuneo; and Matsuki, Yutaka, 4,327,193, Cl. 521-88.000.

Matsumoto, Shigetoshi: *See*—
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Matsumoto, Yoichi, to Metallgesellschaft Aktiengesellschaft. Dust-collecting assembly for electrostatic precipitator. 4,326,861, Cl. 55-112.000.
Matsunaga, Tomiyuki: *See*—
Fukushima, Tsunekazu; Matsunaga, Tomiyuki; and Funakoshi, Satoshi, 4,327,086, Cl. 424-177.000.
Matsuo, Takashi: *See*—
Mizutani, Toshio; Itaya, Nobushige; Ohno, Nobuo; Matsuo, Takashi; Kitamura, Shigeyoshi; and Okuno, Yositosi, 4,327,109, Cl. 424-275.000.
Matsushika, Tadao: *See*—
Matsui, Ryo; Matsushika, Tadao; Hayashi, Yoshio; and Shiga, Tetsuo, 4,327,176, Cl. 430-619.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Hiya, Koji; Miyoshi, Yoshiyuki; and Machida, Kanji, 4,326,908, Cl. 156-215.000.
Ikeda, Nobuo; and Yoshimura, Hirofumi, 4,327,267, Cl. 219-10.55F.
Kohara, Rikusei; Kakumoto, Susumu; Aoyama, Takashi; Shoji, Masami; and Shinagawa, Mutsuaki, 4,326,777, Cl. 350-357.000.
Matsuda, Yoshiteru; Tomimoto, Tetsuo; and Nagaoka, Yoshitomo, 4,327,374, Cl. 358-28.000.
Muranaka, Takayoshi; and Mori, Hajime, 4,327,400, Cl. 361-433.000.
Nawa, Motoyuki; Sugawara, Norio; and Takahashi, Yutaka, 4,326,452, Cl. 98-40.0VT.
Terada, Jiro; and Nitta, Tsuneharu, 4,326,414, Cl. 73-336.500.
Tomita, Masao; Isaka, Takenobu; Mino, Mineo; and Fujisawa, Kiyoji, 4,327,384, Cl. 360-77.000.
Matsushita Electric Works, Ltd.: *See*—
Kitagawa, Fumio; and Ichinomiya, Tsutomu, 4,326,536, Cl. 128-682.000.
Matsushita Industry Co., Ltd.: *See*—
Sabase, Makoto; and Sakaitani, Mario, 4,326,651, Cl. 222-439.000.
Matsuura, Ryouichi: *See*—
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Matsuyama Petrochemicals Inc.: *See*—
Shigeyasu, Motoo; and Kitamura, Takehiko, 4,327,226, Cl. 562-416.000.
Mattel, Inc.: *See*—
Tran, Luan G.; Effler, Timothy A.; and Wat, Karen K., 4,326,719, Cl. 273-238.000.
Mattsson, Agne T., to Aktiebolaget Bahco Ventilation. Method and apparatus in defibration. 4,326,913, Cl. 162-17.000.
Matumoto, Kunio: *See*—
Mituhashi, Kazuyuki; Matumoto, Kunio; Shirai, Haruo; and Tanaka, Yoshikatu, 4,327,247, Cl. 174-68.500.
Maurer, Werner; and Farian, Gerhard, to Karl M. Reich, Maschinenfabrik GmbH. Magazine for feeding headed fasteners into a driving apparatus. 4,326,661, Cl. 227-120.000.
Mayer, Dieter: *See*—
Schaefer, Dieter; Motz, Herbert; Mayer, Dieter; Deigner, Paul; Hack, Joachim; and Falk, Roland, 4,327,139, Cl. 428-65.000.
Mayer, Endre A.: *See*—
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Mayr, Gunter: *See*—
Leonhardt, Fritz; Andra, Wolfhart; Zellner, Wilhelm; Schlaich, Jorg; and Mayr, Gunter, 4,326,363, Cl. 52-80.000.
Mazur, Antoni, deceased: *See*—
Pajak, Andrzej; Olszowski, Tadeusz; Mazur, Antoni, deceased; Holtzer, Mariusz; Marzencki, Andrzej; and Jachowicz, Adam, 4,326,578, Cl. 164-15.000.
Mazur, Irena, legal representative: *See*—
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Mazzola, Louis R., to Lever Brothers Company. Encapsulated bleaches and methods for their preparation. 4,327,151, Cl. 428-407.000.
McAdams, Hugh P., to Texas Instruments, Incorporated. Column decoder discharge for semiconductor memory. 4,327,426, Cl. 365-203.000.
McAllister, David L.: *See*—
Ayres, James T.; McAllister, David L.; and Sands, John L., 4,327,227, Cl. 568-639.000.
McAllister, John H.; Stewart, Lindsay G.; Gladysz, Carl V.; and Wilson, Jim, to Dofasco Inc. Basic process of producing basic fluxed pellets for iron-making. 4,326,887, Cl. 75-257.000.
McBride, Thomas: *See*—
Colognori, Aldo, 4,326,321, Cl. 24-265.00B.
McCandless, Frank P.: *See*—
Berg, Lloyd; McCandless, Frank P.; and Ramer, Ronald J., 4,326,995, Cl. 252-465.000.
McCarry, John D.: *See*—
Foley, William M., Jr., 4,327,202, Cl. 526-245.000.
McCleery, Winston T. Computer power/temperature protector. 4,327,397, Cl. 361-90.000.
McClimon, Robert A. Golf driving target apparatus. 4,326,717, Cl. 273-181.00F.
McDonnell Douglas Corporation: *See*—
Roe, George W., 4,326,847, Cl. 434-12.000.
Thompson, Phillip B.; and Roberts, Hill W., 4,326,599, Cl. 181-175.000.
McElroy, David J., to Texas Instruments Incorporated. Method of making a contact programmable double level polysilicon MOS read only memory. 4,326,329, Cl. 29-571.000.
McFee, Richard. Dual open cycle heat pump and engine. 4,326,388, Cl. 62-324.600.
McGill, William C., to Union Carbide Corporation. Adjustable hub mount for circular saw blade. 4,326,361, Cl. 51-168.000.
McGraw-Edison Company: *See*—
Siiberg, Hemming G., 4,327,401, Cl. 362-183.000.
McGraw, Val R. Combination adjustable/lockable/measuring wrench, and methods of constructing and utilizing same. 4,326,436, Cl. 81-165.000.
McIntyre, Craig R.: *See*—
Moult, Roy H.; and McIntyre, Craig R., 4,326,669, Cl. 238-36.000.
McMeekan, Kenneth R.: *See*—
Hardwick, Michael J.; and McMeekan, Kenneth R., 4,326,544, Cl. 131-369.000.
McNeely, Michael L., to RCA Corporation. Method for producing disc records having molded-in center holes. 4,327,047, Cl. 264-107.000.
McNutt, Darrell A. Hay bale handling apparatus. 4,326,827, Cl. 414-24.500.
McStravick, David M., to Baker International Corporation. Method and apparatus for treating well components with a corrosion inhibiting fluid. 4,326,585, Cl. 166-244.00C.
McStravick, David M., to Baker International Corporation. Well tool having knitted wire mesh seal means and method of use thereof. 4,326,588, Cl. 166-387.000.
McVay, Kenneth R.; Lakes, Stephen C.; and Zilch, Karl T., to Emery Industries, Inc. Process for reducing the polyunsaturates content in mixtures of unsaturated fatty acids and/or fatty acid esters. 4,327,030, Cl. 260-407.000.
McWilliams, Joseph A., to Micropore International Limited. Smooth top cookers. 4,327,280, Cl. 219-464.000.
Mead Corporation, The: *See*—
Wood, Prentice J., 4,326,628, Cl. 206-158.000.
Meharg, Richard D.: *See*—
Gall, John C.; and Meharg, Richard D., 4,326,732, Cl. 280-642.000.
Mehta, Jasu G. Respiratory monitor. 4,326,404, Cl. 73-29.000.
Mellon, Alice D.: *See*—
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Melpolder, John B.: *See*—
Deichert, William G.; Friends, Gary D.; Melpolder, John B.; and Park, Joon S., 4,327,203, Cl. 526-279.000.
Melville, James B., to Lever Brothers Company. Liquid formulations for depositing perfumes on fabrics. 4,326,967, Cl. 252-8.800.
Mendehall, Robert L. Recycling apparatus for asphaltic concrete. 4,326,809, Cl. 366-4.000.
Mendiratta, Ashok K., to General Electric Company. Recovery of bisphenol-A values. 4,327,229, Cl. 568-728.000.
Menth, Anton: *See*—
Banziger, Robert; Isenschmid, Roland; Menth, Anton; Muller, Rene; and Stucki, Samuel, 4,326,943, Cl. 204-290.00F.
Merck & Co., Inc.: *See*—
Cottrell, Ian W.; Baird, John K.; and Shim, Jaewon L., 4,326,970, Cl. 252-8.55D.
Merion Corporation, The: *See*—
MacDonald, Paul, 4,326,326, Cl. 29-428.000.
Merrick, James W., to Autotronic Controls, Corp. Multiple spark discharge ignition system. 4,326,493, Cl. 123-606.000.
Messenger, David F.: *See*—
Moudgil, Brij M.; and Messenger, David F., 4,326,950, Cl. 209-3.300.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Sepp, Gunther, 4,327,129, Cl. 427-164.000.
Metallgesellschaft Aktiengesellschaft: *See*—
Matsumoto, Yoichi, 4,326,861, Cl. 55-112.000.
"Metallurgie Hoboken - Overpelt": *See*—
Winand, Rene, 4,326,942, Cl. 204-275.000.
Metra, Piero, to Industrie Pirelli, S.p.A. Sealing end for direct current electric cables. 4,327,245, Cl. 174-19.000.
Meyer, Gunther: *See*—
Ackermann, Otto; Leuck, Hans; Meyer, Gunther; and Schmeling, Gerhard, 4,327,230, Cl. 568-851.000.
Meyer, James S.; Robinson, Ken K.; Forgac, John M.; and Tatterson, David F., to Standard Oil Company (Indiana). Rapid hydropyrolysis of carbonaceous solids. 4,326,944, Cl. 208-8.00R.
Meyers, George L., to American Can Company. Side loading, top opening, reclosable carton. 4,326,634, Cl. 206-626.000.
Meyers, Robert A., to TRW Inc. Production of potassium formate from potassium sulfate. 4,327,070, Cl. 423-555.000.
Mezger, Manfred; Leussink, Reinhard; and Fritz, Adolf, to Robert Bosch GmbH. Apparatus for generating an ignition control signal for an internal combustion engine. 4,326,486, Cl. 123-418.000.
Micetich, Ronald G.; Shaw, Chia-Cheng; and Rastogi, Ram B., to CDC Life Sciences Inc. 3,4-Diarylisoxazol-5-acetic acids and process for making same. 4,327,222, Cl. 548-247.000.
Micheron, Francois, to Thomson-CSF. Composite piezoelectric material in the form of a film and a method of fabrication of said material. 4,327,153, Cl. 428-421.000.
Michigan Instruments, Inc.: *See*—
Barkalow, Clare E., 4,326,507, Cl. 128-54.000.
Micro Metalsmiths Limited: *See*—
Shaw, Christopher W., 4,326,357, Cl. 46-217.000.

Micropore International Limited: *See*—
McWilliams, Joseph A., 4,327,280, Cl. 219-464.000.
Midland-Ross Corporation: *See*—
Schregenberger, Alex J., 4,326,342, Cl. 34-47.000.
Migliori, Albert, to United States of America, Energy. Nondestructive acoustic electric field probe apparatus and method. 4,326,417, Cl. 73-601.000.
Mikulcova, Dagmar: *See*—
Novak, Jan; Sorm, Miloslav; Ulbert, Karel; Nespurek, Stanislav; Mikulcova, Dagmar; and Cmolik, Jiri, 4,326,966, Cl. 252-8.800.
Miles, Felix A.; and Roush, Dale P., to Ingenuity Incorporated. Film cleaner. 4,326,315, Cl. 15-77.000.
Miles, John E. P.: *See*—
Schofield, Clive; and Miles, John E. P., 4,326,810, Cl. 366-106.000.
Millar, John D. Stove for solid fuel. 4,326,495, Cl. 126-77.000.
Miller, Douglas A., to General Motors Corporation. Floor mounted transmission shift console. 4,326,432, Cl. 74-475.000.
Miller, Frederick O. Method of forming automotive headliners from composite foamed resin blanks. 4,327,049, Cl. 264-138.000.
Miller, Robert N.; and Smith, Richard L., to Lockheed Corporation. Protective coating to retard crack growth in aluminum alloy. 4,327,152, Cl. 428-419.000.
Miltenberger, Charles W.; Lucas, Edward J.; and Schreier, Ulrich, to Technology Glass Corporation. Method for making perforations or depressions in a glass work piece. 4,326,872, Cl. 65-112.000.
Mimori, Takashi: *See*—
Endo, Yasuhiko; Mimori, Takashi; and Goto, Motohiro, 4,327,188, Cl. 501-134.000.
Minami, Koichi; and Watanabe, Hiroyuki, to Tomy Kogyo Co., Inc. Toy having attack object located on arcuate moving framework. 4,326,721, Cl. 273-315.000.
Mine Safety Appliances Company: *See*—
Chiu, Kuen-Wai; and Strickler, John R., 4,327,071, Cl. 423-646.000.
Minezaki, Shigehiro; Takamatsu, Toshiaki; and Kozaki, Shuichi, to Sharp Kabushiki Kaisha. Formation of an electrode pattern. 4,326,929, Cl. 204-15.000.
Ministry of Inernational Trade & Industry: *See*—
Nakao, Yukimichi; and Fujishige, Shoei, 4,327,235, Cl. 585-270.000.
Minnesota Diversified Products, Inc.: *See*—
Slavik, Raymond F., 4,326,909, Cl. 156-253.000.
Minnesota Mining and Manufacturing Company: *See*—
Dillon, Kenneth R.; and Gardner, Richard N., 4,327,156, Cl. 428-568.000.
Drake, James F., Jr.; and Rambosek, G. Phillip, 4,326,524, Cl. 128-260.000.
Eian, Gilbert L., 4,326,514, Cl. 128-202.220.
Hammar, Walton J., 4,326,532, Cl. 128-349.00R.
Hunder, David N.; and Hervig, Harold C., Jr., 4,326,735, Cl. 285-15.000.
Ou-Yang, David T., 4,327,147, Cl. 156-69.000.
Silbernagel, Raymond A.; and Sjolander, Garry L., 4,326,767, Cl. 339-98.000.
Mino, Mineo: *See*—
Tomita, Masao; Isaka, Takenobu; Mino, Mineo; and Fujisawa, Kiyoji, 4,327,384, Cl. 360-77.000.
Minolta Camera Kabushiki Kaisha: *See*—
Kawamura, Kunio; and Ueda, Hiroshi, 4,326,783, Cl. 354-25.000.
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Lyu, Seung W.; and Misra, Surya K., 4,326,896, Cl. 148-12.00D.
Missout, Gilles; Lalonde, Francois; and Cloutier, Marius, to Institut de Recherche de l'Hydro-Quebec. Electronic low-pass filter circuit with an adjustable long time base. 4,327,335, Cl. 331-1.00A.
Mistarz, Robert J., to Vercon Inc. Variable volume, positive displacement sanitary liquid dispensing machine. 4,326,567, Cl. 141-90.000.
Mitani, Tomomasa; Ogasawara, Yoshimi; and Hiraishi, Shunichi, to Dainippon Inc. & Chemicals, Inc. Process for producing sheet molding compound. 4,327,145, Cl. 428-290.000.
Mitchell, David T.: *See*—
Cogswell, Frederic N.; and Mitchell, David T., 4,327,053, Cl. 264-515.000.
Mitsubishi Denke Kabushiki Kaisha: *See*—
Sakurai, Takeyoshi; and Kobayashi, Noboru, 4,327,263, Cl. 200-148.00A.
Mitsubishi Gas Chemical Co., Inc.: *See*—
Isogai, Nobuo; Hosokawa, Motoyuki; Okawa, Takashi; and Wakui, Natsuko, 4,327,225, Cl. 560-205.000.
Mitsubishi Kenki Kabushiki Kaisha: *See*—
Hosokawa, Yasuhiko; Katsuki, Kanji; and Suzuki, Toshio, 4,327,314, Cl. 318-722.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Toyama, Kohji; Fuchigami, Mitsuru; Nagayasu, Isao; and Tsukahara, Hirokazu, 4,327,148, Cl. 428-320.800.
Mitsui Engineering and Shipbuilding Co., Ltd.: *See*—
Oshima, Masanao; and Yashima, Nobuyoshi, 4,326,822, Cl. 405-217.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Masuda, Takayoshi; Honjo, Masaru; Takase, Tsutomu; and Watanabe, Yoshimoto, 4,327,183, Cl. 435-274.000.
Mitsumi Electric Co., Ltd.: *See*—
Iwao, Takayuki; Ono, Takemitsu; and Ishikawa, Yukio, 4,326,459, Cl. 101-93.300.
Mituhashi, Kazuyuki; Matumoto, Kunio; Shirai, Haruo; and Tanaka, Yoshikatu, to Shin-Kobe Electric Machinery Co., Ltd.; and Shirai Eenshi Kogyo Co., Ltd. Printed wiring board. 4,327,247, Cl. 174-68.500.
Miura, Masao: *See*—
Iwai, Tadashi; Mizuno, Hisayuki; and Miura, Masao, 4,327,062, Cl. 423-292.000.
Miyamoto, Koichi; Kan, Yasuhito; Nitanda, Hiroshi; and Ariga, Masao, to Canon Kabushiki Kaisha. Copying apparatus capable of changing over the copying mode and the copying magnification. 4,326,797, Cl. 355-57.000.
Miyazaki, Katsuyuki: *See*—
Ohara, Susumu; Horiki, Akira; Miyazaki, Katsuyuki; and Tokunaga, Kaoru, 4,327,436, Cl. 370-110.100.
Miyoshi, Yoshiyuki: *See*—
Hiya, Koji; Miyoshi, Yoshiyuki; and Machida, Kanji, 4,326,908, Cl. 156-215.000.
Mizumoto, Yasuhiro; Tozawa, Yukio; Kozima, Masatoshi; and Hirai, Masaru, to Yokohama Rubber Co., Ltd., The. Rubber composition employing soft black and a thermosetting resin and tires employing said composition. 4,326,576, Cl. 152-356.00R.
Mizuno, Hisayuki: *See*—
Iwai, Tadashi; Mizuno, Hisayuki; and Miura, Masao, 4,327,062, Cl. 423-292.000.
Mizutani, Masato; Tsushima, Kazunori; Sanemitsu, Yuzuru; and Hirano, Masachika, to Sumitomo Chemical Company, Limited. Insecticidal and acaricidal 3,5-dioxo-2,3,4,5-triazine compounds. 4,327,094, Cl. 424-249.000.
Mizutani, Toshio; Itaya, Nobushige; Ohno, Nobuo; Matsuo, Takashi; Kitamura, Shigeyoshi; and Okuno, Yositosi, to Sumitomo Chemical Company Limited. Novel alkadienylcyclopropanecarboxylates. 4,327,109, Cl. 424-275.000.
Mobil Oil Corporation: *See*—
Benoit, Gordon L.; Bustin, Franz; and Donaldson, Jack J., 4,326,664, Cl. 229-54.00R.
Chester, Arthur W.; and Stover, William A., 4,326,993, Cl. 252-455.00Z.
Haag, Werner O.; and Lago, Rudolph M., 4,326,994, Cl. 252-455.00Z.
Ueberschaer, Hubert J., 4,326,427, Cl. 73-864.650.
Mochida, Haruo; and Kawashima, Hatsuo, to Nissan Motor Company Limited; and Fuji Kiko Kabushiki Kaisha. Clutch system for a vehicle. 4,326,616, Cl. 192-111.00A.
Mochida, Haruo; and Kobayashi, Tetsuo, to Nissan Motor Company, Limited. Clearance adjusting device. 4,326,617, Cl. 192-111.00B.
Mochizuki, Daisuke; and Sugitani, Toshio, to Sharp Kabushiki Kaisha. Construction of change holder for use in electronic calculating machine. 4,326,550, Cl. 133-2.000.
Model, Ernst, to Ciba-Geigy Corporation. Iminoisoindolinone pigments, process for their production and use thereof. 4,327,024, Cl. 260-325.0PH.
Moebius, Leander: *See*—
Hickmann, Eckhard; Oeser, Heinz-Guenter; and Moebius, Leander, 4,327,215, Cl. 546-176.000.
Moebus, Otto; Teuber, Michael; and Kiesbye, Peter. Method of breeding of yeast on solutions, containing lactose, and ground cereal products and/or other sugar and polysaccharide products. 4,327,179, Cl. 435-42.000.
Moeglich, Karl, to Innova, Inc. Electrochemical processes utilizing a layered membrane. 4,326,935, Cl. 204-180.00P.
Moesch, Boris, to Ciba-Geigy Corporation. Soap bar with antimicrobial action. 4,326,978, Cl. 252-107.000.
Mohanta, Samaresh: *See*—
Das Gupta, Sankar; Jacobs, James K.; and Mohanta, Samaresh, 4,326,938, Cl. 204-228.000.
Mohlmann, Willem M. M.: *See*—
Bus, Jan; Mohlmann, Willem M. M.; and Pritchard, Norman J., 4,326,979, Cl. 252-158.000.
Mohr, Heinz; Hoffmann, Walter; and Vyvial, Rudolf, to BASF Aktiengesellschaft. Process for underlaying a flat-bed steel rule die. 4,326,434, Cl. 76-107.00C.
Moldenhauer, Donald: *See*—
Engle, Carl E.; and Moldenhauer, Donald, 4,326,675, Cl. 241-236.000.
Molina, Orlando G., to Rockwell International Corporation. Nonstaining leak tracer solution and method employing same. 4,326,981, Cl. 252-301.190.
Mollett, Christopher C., to Pira, The Research Association for the Paper and Board, Printing and Packaging Industries. Process for improving the quality of pulp obtained from wastepaper. 4,326,912, Cl. 162-5.000.
Molz, Claudius: *See*—
Weigert, Kurt; and Molz, Claudius, 4,326,538, Cl. 128-702.000.
Momonoi, Kaishu: *See*—
Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,327,097, Cl. 424-250.000.
Monsanto Company: *See*—
Coran, Aubert Y.; and Patel, Raman, 4,327,199, Cl. 525-176.000.
Crutchfield, Marvin M., 4,327,189, Cl. 501-148.000.
Montavon, Marc; and Reiner, Roland, to Hoffmann-La Roche Inc. Thiazolylacelamide cephalosporins. 4,327,210, Cl. 544-027.000.
Moore, Richard A.: *See*—
Ramlow, Gerhard G.; Heyman, Duane A.; and Moore, Richard A., 4,327,005, Cl. 524-377.000.
Moore, Richard L., to Rockwell International Corporation. Apparatus for converting incident microwave energy to thermal energy. 4,327,364, Cl. 343-18.00A.

Moret, Michel-Antoine; and Jousson, Pierre-Jean, to Les Produits Associes. LPA. Electrically driven hand-held apparatus for body care, in particular a toothbrush or massage apparatus. 4,326,314, Cl. 15-22.00R.

Mori, Hajime: *See*—
Muranaka, Takayoshi; and Mori, Hajime, 4,327,400, Cl. 361-433.000.

Morisawa, Kunio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Transmission support assembly in vehicle. 4,326,816, Cl. 403-228.000.

Morishita, Masanobu: *See*—
Tanaka, Takanori; and Morishita, Masanobu, 4,327,378, Cl. 358-228.000.

Morita, Keiichi: *See*—
Ozu, Masao; Morita, Keiichi; and Itoh, Hiroshi, 4,326,868, Cl. 62-324.600.

Moroz, Viktor M.; Lezin, Nikolai Y.; Pavlov, Tengiz A.; and Ilmensky, Vladimir V. Rest for drilling rig. 4,326,756, Cl. 308-3.900.

Mortensen, Harold R., to Facet Enterprises, Inc. Engine starter drive assembly with shielding means. 4,326,429, Cl. 74-7.00R.

Mortenson, Carl W. Purification apparatus. 4,326,923, Cl. 202-185.00R.

Morton, Ray E. Metal shears. 4,326,335, Cl. 30-254.000.

Moser, Raymond L.: *See*—
Fridley, Robert B.; and Moser, Raymond L., 4,326,570, Cl. 144-34.00R.

Mossey, Paul W., to General Electric Company. Apparatus and method for optical clearance determination. 4,326,804, Cl. 356-375.000.

Motegi, Akio; and Saitoh, Takao, to Sanyei Corporation. Curling iron. 4,326,545, Cl. 132-33.00R.

Motoren- und Turbinen-Union Muenchen GmbH: *See*—
Rossmann, Axel, 4,327,154, Cl. 428-545.000.

Motorola, Inc.: *See*—
Dressler, Roger W., 4,327,446, Cl. 455-223.000.
Scianna, Anthony, Sr.; and Gordon, Frank J., 4,326,660, Cl. 226-190.000.
Swisher, Scott N.; and Furman, Edward L., 4,327,319, Cl. 323-303.000.

Motz, Herbert: *See*—
Schaefer, Dieter; Motz, Herbert; Mayer, Dieter; Deigner, Paul; Hack, Joachim; and Falk, Roland, 4,327,139, Cl. 428-65.000.

Moudgil, Brij M.; and Messenger, David F., to Occidental Research Corporation. Process for separating oil shale waste material. 4,326,950, Cl. 209-3.300.

Moult, Roy H.; and McIntyre, Craig R., to Koppers Company, Inc. Laminated wooden railroad crossite having exposed end-grain forming part of the load bearing surface. 4,326,669, Cl. 238-36.000.

Mouza, Jean-Claude, to Societe Anonyme Francaise du Ferodo. Protective shield device for brake. 4,326,610, Cl. 188-218.00A.

MTD Products Inc.: *See*—
LaBoda, John A.; and Fortlage, Paul R., 4,326,453, Cl. 98-87.000.

Muenger, James R.; Child, Edward T.; and Brent, Albert, to Texaco Development Corporation. Production of cleaned and cooled synthesis gas. 4,326,856, Cl. 48-197.00R.

Muetterties, Andrew J.: *See*—
D'Alo, Herbert F.; and Muetterties, Andrew J., 4,326,519, Cl. 128-214.400.

Muller, Horst; and Wirth, Hermann O., to Ciba-Geigy Corporation. Stabilizer mixtures for stabilizing chlorinated thermoplastics. 4,327,000, Cl. 524-285.000.

Muller, Horst: *See*—
Wehner, Wolfgang; Muller, Horst; and Kostler, Hans-Gunter, 4,327,016, Cl. 524-180.000.

Muller, Otto, to Sulzer Brothers Limited. Backwashable filter system. 4,326,956, Cl. 210-277.000.

Muller, Rene: *See*—
Banziger, Robert; Isenschmid, Roland; Menth, Anton; Muller, Rene; and Stucki, Samuel, 4,326,943, Cl. 204-290.00F.

Mulvaney, James M.: *See*—
Beard, George W.; and Mulvaney, James M., 4,327,353, Cl. 340-64.000.

Murakami, Kazuhito: *See*—
Kamijo, Eiji; Murakami, Kazuhito; and Tani, Katsuto, 4,326,931, Cl. 204-22.000.

Murakami, Masahiro; Kobayashi, Masateru; Sone, Takanori; and Shibuya, Chisei, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for preparation of cephalosporin compounds. 4,327,211, Cl. 544-27.000.

Muranaka, Takayoshi; and Mori, Hajime, to Matsushita Electric Industrial Co., Ltd. Electric double layer capacitor. 4,327,400, Cl. 361-433.000.

Murata, Yorihiro; and Weber, Gary W., to Kennecott Corporation. Sintered silicon carbide-titanium diboride mixtures and articles thereof. 4,327,186, Cl. 501-92.000.

Murata, Yukiho; and Inoshita, Yasushi, to Nissan Motor Company, Limited. Automatic temperature adjusting type air conditioner. 4,326,667, Cl. 237-12.30A.

Murayama, Yoshinobu; and Yoshii, Takashi, to Kubota, Ltd. Agricultural tractor. 4,326,597, Cl. 180-70.0MS.

Murray, Frank C.: *See*—
Ryan, Lenore S.; Murray, Frank C.; Sprangers, Ann M.; Santoski, William J.; Sciaraffa, Michael A.; Abel, Kent W.; and Donnelly, Harold F., 4,326,528, Cl. 128-287.000.

Murzin, Horst; Woss, Rainer; Burghoff, Hans; Schmieder, Frank; Herzig, Alfred; Junge, Johannes; and Deckarm, Gunter, to VEB Kombinat Walzlager und Normteile. Transverse conveyor for conveying pin-shaped work pieces in a multi-station. 4,326,625, Cl. 198-653.000.

Mushika, Yoshitaka; Tani, Junichi; Yamaguchi, Totaro; and Ohshima, Satoshi, to Tanabe Seikaku Co., Ltd. Quinoline compound useful as antibacterial agents in warm-blooded animals. 4,327,101, Cl. 424-258.000.

Musyakin, Vyacheslav E.: *See*—
Beznosjuk, Evgeny I.; Doktorov, Leonid B.; Musyakin, Vyacheslav E.; and Kolomeets, Sergei V., 4,326,823, Cl. 407-51.000.

Mutschler, Edward C., Jr., to Xerox Corporation. Sheet de-curler. 4,326,915, Cl. 162-271.000.

Mutschler, Erich: *See*—
Botz, Jakob; Feger, Rolf; Mutschler, Erich; Spazierer, Hubert; and Weber, Adam, 4,327,264, Cl. 200-295.000.

N. V. Weefautomaten Picanol: *See*—
Lampaert, Roger R., 4,326,566, Cl. 139-453.000.

Nagaoka, Yoshitomo: *See*—
Matsuda, Yoshiteru; Tomimoto, Tetsuo; and Nagaoka, Yoshitomo, 4,327,374, Cl. 358-28.000.

Nagatomo, Katsuaki: *See*—
Fujiwara, Kiyoshi; Nagatomo, Katsuaki; Yoshinaga, Shoji; Tamura, Zensuke; Shibata, Fumio; and Kanekiyo, Hiroshi, 4,326,666, Cl. 233-15.000.

Nagayasu, Isao: *See*—
Toyama, Kohji; Fuchigami, Mitsuru; Nagayasu, Isao; and Tsukahara, Hirokazu, 4,327,148, Cl. 428-320.800.

Nagel, Hartmut; and Stucki, Samuel, to BBC Brown, Boveri & Company, Limited. Method for electrolytic deposition of metals. 4,326,930, Cl. 204-20.000.

Nakade, Toshiaki: *See*—
Yamada, Mitsuhiko; and Nakade, Toshiaki, 4,327,380, Cl. 358-264.000.

Nakajima, Tadakatsu: *See*—
Sato, Eiji; Arai, Nobukatsu; Tanaka, Hideki; Fukushima, Toshihiko; and Nakajima, Tadakatsu, 4,326,391, Cl. 62-402.000.

Nakamura, Masuhisa: *See*—
Inouye, Ken; Kono, Masao; Yoshida, Nobuo; Nakamura, Masuhisa; Okabayashi, Tadashi; and Igano, Ken'ichi, 4,327,072, Cl. 424-1.000.

Nakamura, Munekazu: *See*—
Asaoka, Sachio; Shiroto, Yoshimi; Nakamura, Munekazu; and Ono, Takeo, 4,326,991, Cl. 252-432.000.

Nakamura, Sadayuki: *See*—
Abeyama, Shozo; Saito, Makoto; Kimura, Atsuyoshi; and Nakamura, Sadayuki, 4,326,886, Cl. 75-129.000.

Nakao, Yukimichi; and Fujishige, Shoei, to Agency of Industrial Science & Technology; and Ministry of Inernational Trade & Industry. Method for preferential hydrogenation of terminal methylene group in compound possessing terminal methylene group. 4,327,235, Cl. 585-270.000.

Nakayama, Shoji: *See*—
Sugai, Hiroshi; and Nakayama, Shoji, 4,326,846, Cl. 433-132.000.

Nakazaki, Takamitsu: *See*—
Kita, Hisanao; Karatsu, Yoshinori; Nakazaki, Takamitsu; and Akutsu, Yoji, 4,327,273, Cl. 219-121.0EC.

Narita, Hiroshi: *See*—
Tsuboi, Takashi; Okamatsu, Shigetoshi; Ibamoto, Masahiko; Narita, Hiroshi; and Kozu, Eiji, 4,327,313, Cl. 318-52.000.

National Can Corporation: *See*—
Lyu, Seung W.; and Misra, Surya K., 4,326,896, Cl. 148-12.00D.
Sauer, Donald G., 4,327,052, Cl. 264-512.000.

National Gypsum Company: *See*—
White, George H., 4,327,146, Cl. 428-308.800.

National Research Development Corporation: *See*—
Schofield, Clive; and Miles, John E. P., 4,326,810, Cl. 366-106.000.

National Semiconductor Corporation: *See*—
Bryant, Richard W., 4,326,443, Cl. 84-1.260.
Wilcox, Milton E., 4,327,333, Cl. 330-278.000.

National-Standard Company: *See*—
Pond, Robert B., Sr.; and Winter, John M., Jr., 4,326,579, Cl. 164-461.000.

National Starch and Chemical Corporation: *See*—
Eckert, Rene A.; and Schmuck, Guenter E., 4,326,904, Cl. 156-85.000.

Nauerth, Karl-Heinz, to Fritz Eichenauer, Firma. Electrical resistance heating element. 4,327,282, Cl. 219-541.000.

Nawa, Motoyuki; Sugawara, Norio; and Takahashi, Yutaka, to Matsushita Electric Industrial Co., Ltd. Fluid diverting assembly. 4,326,452, Cl. 98-40.0VT.

NCR Corporation: *See*—
Patel, Rameshchandra S.; and Easley, Mark R., 4,327,410, Cl. 364-200.000.

Negretti & Zambra (Aviation) Limited: *See*—
Kahn, David A., 4,326,798, Cl. 356-45.000.

Nemoto, Minoru: *See*—
Asaba, Shuuji; Nemoto, Minoru; Ushimi, Kenji; and Ono, Akira, 4,327,275, Cl. 219-121.0LD.

Nespurek, Stanislav: *See*—
Novak, Jan; Sorm, Miloslav; Ulbert, Karel; Nespurek, Stanislav; Mikulcova, Dagmar; and Cmolik, Jiri, 4,326,966, Cl. 252-8.800.

Nessi, Aurindo, to Innocenti Santeustacchio S.p.A. Apparatus for lifting a heavy load and transporting it over an obstruction. 4,326,829, Cl. 414-357.000.

Neumann, Konrad; and Schenkenberger, Ernst, to Ciba-Geigy Corporation. Process for the manufacture of fine-crystalline fluorescent brighteners of the bis-triazinylaminostilbene series in the β-crystal form. 4,326,982, Cl. 252-301.230.

Neumeier, Karl E.; and Sullivan, Robert J., to PaR Systems Corp. Grab mechanism. 4,326,937, Cl. 204-198.000.

Nevamar Corporation: *See—*
Scher, Herbert I.; and Ungar, Israel S., 4,327,141, Cl. 428-148.000.
Newman, Albert F.: *See—*
Branovich, Louis E.; Daly, Edward; Newman, Albert F.; and Smith, Willis M., 4,327,131, Cl. 427-229.000.
Nickel, Gerhard E. B.; and Darr, Richard C., to Plastipak Packaging Division, Beatrice Food Co. Combination base cup and bottle. 4,326,638, Cl. 215-12.00R.
Nickerson, James H. D.: *See—*
Ruhe, Anthony; Chitty, John A.; and Nickerson, James H. D., 4,326,897, Cl. 148-13.100.
Nielinger, Werner: *See—*
Lehr, Gunter; Hucks, Uwe; Vernaleken, Hugo; Nielinger, Werner; and Tresper, Erhard, 4,327,208, Cl. 528-323.000.
Nielsen, Werner K.: *See—*
Madsen, Rud F.; and Nielsen, Werner K., 4,326,892, Cl. 127-43.000.
Nienhaus, Clemens: *See—*
Geisthoff, Hubert; and Nienhaus, Clemens, 4,326,392, Cl. 64-3.000.
Nienow, John F.: *See—*
Laszlo, Tibor S.; Nienow, John F.; Sherwood, John F.; and Irving, Christopher L., 4,326,542, Cl. 131-280.000.
Niessner, Peter: *See—*
Kratel, Gunter; Dummer, Gerhard; Niessner, Peter; Grune, Burkhard; and Stohr, Gunter, 4,326,852, Cl. 23-293.00R.
Nightingale, Douglas J., to Rolls-Royce Limited. Mounting for gas turbine powerplant. 4,326,682, Cl. 244-54.000.
Nihon Nohyaku Co., Ltd.: *See—*
Matsui, Hisanori; Tanaka, Hiroshi; Yabutani, Kunihiro; and Kurono, Hitoshi, 4,327,223, Cl. 549-39.000.
Nihonshikizai Kogyo Co., Ltd.: *See—*
Iwamoto, Seigo; and Saito, Eiichi, 4,327,017, Cl. 260-105.000.
Ninomiya, Hiroshi: *See—*
Matsuda, Akira; Yoshioka, Osamu; Takahashi, Katsutoshi; Yoshida, Kooichi; and Ninomiya, Hiroshi, 4,327,081, Cl. 424-81.000.
Nippon Electric Co., Ltd.: *See—*
Furuya, Yukitsuna; and Akashi, Fumio, 4,327,440, Cl. 375-76.000.
Tanaka, Takanori; and Morishita, Masanobu, 4,327,378, Cl. 358-228.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Imamura, Akio; and Oya, Akiyoshi, 4,326,441, Cl. 84-1.030.
Suzuki, Hideo, 4,326,442, Cl. 84-1.190.
Nippon Kayaku Kabushiki Kaisha: *See—*
Matsuda, Akira; Yoshioka, Osamu; Takahashi, Katsutoshi; Yoshida, Kooichi; and Ninomiya, Hiroshi, 4,327,081, Cl. 424-81.000.
Nippon Kogaku K.K.: *See—*
Ohmori, Sachio; Fukino, Kunihiro; and Ishizaka, Sunao, 4,326,788, Cl. 354-286.000.
Tsukamoto, Masaaki; Ohkubo, Yuji; and Tomino, Naoki, 4,326,785, Cl. 354-60.00F.
Nippon Oil and Fats Company Limited: *See—*
Hattori, Katsuhide; Fukatsu, Yoshiaki; and Takahashi, Masao, 4,326,900, Cl. 149-2.000.
Nippon Soda Company Limited: *See—*
Ueda, Akiyoshi; Takagi, Hideo; and Ohkuma, Kazuhiko, 4,326,881, Cl. 71-95.000.
Nippon Soken, Inc.: *See—*
Yasuda, Eturo; and Ohta, Minoru, 4,327,054, Cl. 422-95.000.
Nippon Telegraph & Telephone Public Corp.: *See—*
Sasaki, Etsuro; and Ohsaki, Takaaki, 4,327,399, Cl. 361-385.000.
Nippondenso Co., Ltd.: *See—*
Ishikawa, Eizi; Matsuura, Ryouichi; and Yano, Kiyotosi, 4,326,696, Cl. 251-129.000.
Takeshita, Mikio; and Tashiro, Hiroyuki, 4,326,413, Cl. 73-313.000.
Nishikawa, Kazuo: *See—*
Okura, Keniti; and Nishikawa, Kazuo, 4,327,433, Cl. 369-139.000.
Nishikawa, Shigeo; and Yokoyama, Masaaki, to Yuka Badische Company Limited. Cooling process suitable for foam molding of a synthetic resin and its cooling apparatus. 4,327,045, Cl. 264-51.000.
Nishimura, Akimasa: *See—*
Hirata, Noritsugu; Toyama, Masamichi; Okajima, Hidekazu; and Nishimura, Akimasa, 4,326,790, Cl. 354-288.000.
Nishimura, Fuminobu, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrostatic copying apparatus. 4,326,794, Cl. 355-3.00R.
Nishioka, Kunihiko: *See—*
Chikata, Tsukasa; Sunami, Yoshihiko; Sasaki, Keiichi; and Nishioka, Kunihiko, 4,326,946, Cl. 208-93.000.
Nisii, Alessandro. Sterilizing-containing device for dental tools. 4,327,060, Cl. 422-300.000.
Nissan Motor Co.: *See—*
Kobayashi, Hiroshi; and Kita, Toru, 4,326,422, Cl. 73-861.220.
Nissan Motor Company, Limited: *See—*
Fujikubo, Yoshitake; and Tanaka, Mamoru, 4,327,316, Cl. 320-2.000.
Kishi, Norimasa, 4,327,418, Cl. 364-715.000.
Kobayashi, Hiroshi; Kita, Toru; and Fujishiro, Takeshi, 4,326,412, Cl. 73-204.000.
Mochida, Haruo; and Kawashima, Hatsuo, 4,326,616, Cl. 192-111.00A.
Mochida, Haruo; and Kobayashi, Tetsuo, 4,326,617, Cl. 192-111.00B.
Murata, Yukiho; and Inoshita, Yasushi, 4,326,667, Cl. 237-12.30A.
Nitanda, Hiroshi: *See—*
Miyamoto, Koichi; Kan, Yasuhito; Nitanda, Hiroshi; and Ariga, Masao, 4,326,797, Cl. 355-57.000.
Nitta, Tsuneharu: *See—*
Terada, Jiro; and Nitta, Tsuneharu, 4,326,414, Cl. 73-336.500.
Nitto Electric Industrial Company Ltd.: *See—*
Iwahori, Hiroshi; and Matsumoto, Shigetoshi, 4,326,960, Cl. 210-650.000.
Nitzberg, Nadine R.; Baldwin, Michelle L.; and Baldwin, Steven M. Container system for carrying and supplying food and water for pets. 4,326,640, Cl. 220-4.00E.
Noble, Peter M., to American Standard Inc. Shelf mount for vital plug-in relay. 4,326,693, Cl. 248-635.000.
Noda, Atsushi, to Canon Kabushiki Kaisha. Thermal printer. 4,327,365, Cl. 346-76.0PH.
North American Philips Consumer Electronics Corp.: *See—*
Penird, Carl W.; and Puhak, Peter G., 4,327,307, Cl. 313-407.000.
North American Philips Corporation: *See—*
Pell, James W., Jr., 4,326,418, Cl. 73-644.000.
Northern Telecom, Inc.: *See—*
Hines, William W.; and Cwirzen, Casimir Z., 4,327,393, Cl. 361-119.000.
Northrop Corporation: *See—*
Lawrence, Anthony W., 4,326,803, Cl. 356-350.000.
Norzi, Vittorio. Method of manufacturing goods of laminates and goods so manufactured. 4,327,142, Cl. 428-198.000.
Novack, Robert L. Game implement. 4,326,714, Cl. 273-73.00C.
Novak, Jan; Sorm, Miloslav; Ulbert, Karel; Nespurek, Stanislav; Mikulcova, Dagmar; and Cmolik, Jiri, to Ceskoslovenska akademie ved. Agent for textile livening with an antistatic effect and favorable dermatologic properties. 4,326,966, Cl. 252-8.800.
Nowack, Gerhard P.; and Johnson, Marvin M., to Phillips Petroleum Company. Hydrogenation process using supported nickel catalyst. 4,327,234, Cl. 585-267.000.
Nozue, Shigehiro; Fukuoka, Tatsuhiko; and Sugiura, Hideaki, to Taiho Kogyo Co., Ltd. Thrust bearing with tapered lands. 4,326,758, Cl. 308-170.000.
Nuckel, Klaus, to Postalia GmbH. Indicating device for an option printing cylinder. 4,326,460, Cl. 101-110.000.
NWL Transformers: *See—*
Laugesen, Thomas C., 4,326,860, Cl. 55-105.000.
Nyman, Frederick R.; Stevens, Barry; and Calamari, James A., Jr., to RCA Corporation. High density information disc processing. 4,327,048, Cl. 264-107.000.
Obenchain, Richard F. Explosion venting means for metallurgical furnace. 4,327,241, Cl. 373-9.000.
Obermajer, Wladimir. Process for measuring the cardiac volume. 4,326,539, Cl. 128-713.000.
Occidental Oil Shale Inc.: *See—*
Ricketts, Thomas E., 4,326,751, Cl. 299-2.000.
Ricketts, Thomas E., 4,326,752, Cl. 299-13.000.
Occidental Petroleum Corporation: *See—*
Cropsey, Leo M., 4,326,505, Cl. 128-1.00R.
Occidental Research Corporation: *See—*
Moudgil, Brij M.; and Messenger, David F., 4,326,950, Cl. 209-3.300.
Odagiri, Hideo: *See—*
Hagino, Hiroshi; Odagiri, Hideo; and Okutani, Junichi, 4,327,042, Cl. 261-77.000.
Oeser, Heinz-Guenter: *See—*
Hickmann, Eckhard; Oeser, Heinz-Guenter; and Moebius, Leander, 4,327,215, Cl. 546-176.000.
Oettel, Friedrich H., to Eltec Instruments, Inc. Pyroelectric detector. 4,326,663, Cl. 228-123.000.
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Mitani, Tomomasa; Ogasawara, Yoshimi; and Hiraishi, Shunichi, 4,327,145, Cl. 428-290.000.
Ogawa, Masahiro: *See—*
Fujimura, Kensuke; Yamamoto, Naomichi; Ogawa, Masahiro; and Tanigawa, Nobuyoshi, 4,327,059, Cl. 422-259.000.
Ogden, Ralph. Method of making printed circuit boards. 4,327,126, Cl. 427-97.000.
Oguey, Henri; and Gerber, Bernard, to Centre Electronique Horloger S.A. Reference voltage source. 4,327,320, Cl. 323-313.000.
Ogura, Wataru, to Chinon Industries Incorporation. Film sag detecting device for sound cinecamera. 4,326,781, Cl. 352-14.000.
Ohara, Susumu; Horiki, Akira; Miyazaki, Katsuyuki; and Tokunaga, Kaoru, to Hitachi, Ltd. Signal monitoring and controlling system in a time division switching system. 4,327,436, Cl. 370-110.100.
Ohkita, Ryozo: *See—*
Okazaki, Masaki; and Ohkita, Ryozo, 4,326,600, Cl. 181-229.000.
Ohkubo, Yuji: *See—*
Tsukamoto, Masaaki; Ohkubo, Yuji; and Tomino, Naoki, 4,326,785, Cl. 354-60.00F.
Ohkuma, Kazuhiko: *See—*
Ueda, Akiyoshi; Takagi, Hideo; and Ohkuma, Kazuhiko, 4,326,881, Cl. 71-95.000.
Ohmori, Sachio; Fukino, Kunihiro; and Ishizaka, Sunao, to Nippon Kogaku K.K. Information transmission means in an intermediate lens tube for camera. 4,326,788, Cl. 354-286.000.
Ohno, Nobuo: *See—*
Mizutani, Toshio; Itaya, Nobushige; Ohno, Nobuo; Matsuo, Takashi; Kitamura, Shigeyoshi; and Okuno, Yositosi, 4,327,109, Cl. 424-275.000.
Ohsaki, Takaaki: *See—*
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Ohshima, Satoshi: *See—*
Mushika, Yoshitaka; Tani, Junichi; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,327,101, Cl. 424-258.000.

Ohta, Masafumi: *See*—
Sasaki, Masaomi; Ohta, Masafumi; and Tsutsui, Kyoji, 4,327,020, Cl. 260-160.000.
Ohta, Minoru: *See*—
Yasuda, Eturo; and Ohta, Minoru, 4,327,054, Cl. 422-95.000.
Oka, Ken K.; and Haag, Peter C., to Deere & Company. Raising and lowering mechanism for farm implement. 4,326,594, Cl. 172-328.000.
Okabayashi, Tadashi: *See*—
Inouye, Ken; Kono, Masao; Yoshida, Nobuo; Nakamura, Masuhisa; Okabayashi, Tadashi; and Igano, Ken'ichi, 4,327,072, Cl. 424-1.000.
Okajima, Hidekazu, to Canon Kabushiki Kaisha. Sound motion picture camera capable of overlapping exposures. 4,326,782, Cl. 352-91.00C.
Okajima, Hidekazu: *See*—
Hirata, Noritsugu; Toyama, Masamichi; Okajima, Hidekazu; and Nishimura, Akimasa, 4,326,790, Cl. 354-288.000.
Okamatsu, Shigetoshi: *See*—
Tsuboi, Takashi; Okamatsu, Shigetoshi; Ibamoto, Masahiko; Narita, Hiroshi; and Kozu, Eiji, 4,327,313, Cl. 318-52.000.
Okawa, Takashi: *See*—
Isogai, Nobuo; Hosokawa, Motoyuki; Okawa, Takashi; and Wakui, Natsuko, 4,327,225, Cl. 560-205.000.
Okazaki, Masaki; and Ohkita, Ryozo, to Yamaha Hatsudoki Kabushiki Kaisha. Intake silencer for outboard motor. 4,326,600, Cl. 181-229.000.
Okumura, Yoshiharu; Furukawa, Hiroshi; and Kaneko, Katsumi, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for the production of tertiary alcohols. 4,327,231, Cl. 568-899.000.
Okuni, Tetsuo: *See*—
Wada, Takeshi; and Okuni, Tetsuo, 4,326,580, Cl. 164-497.000.
Okuno, Yositosi: *See*—
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Okura, Keniti; and Nishikawa, Kazuo, to Pioneer Electronic Corporation. Magnetic phono cartridge. 4,327,433, Cl. 369-139.000.
Okutani, Junichi: *See*—
Hagino, Hiroshi; Odagiri, Hideo; and Okutani, Junichi, 4,327,042, Cl. 261-77.000.
Olin Corporation: *See*—
Capuano, Italo A.; Turley, Patricia A.; and DuBord, Edward W., 4,326,850, Cl. 23-230.00R.
Chandalia, Kiran B.; and Barnowski, Henry G., 4,327,194, Cl. 521-99.000.
Olszowski, Tadeusz: *See*—
Pajak, Andrzej; Olszowski, Tadeusz; Mazur, Antoni, deceased; Holtzer, Mariusz; Marzencki, Andrzej; and Jachowicz, Adam, 4,326,578, Cl. 164-15.000.
Olympus Optical Co., Ltd.: *See*—
Sato, Masaaki, 4,326,659, Cl. 226-190.000.
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Ono, Akira: *See*—
Asaba, Shuuji; Nemoto, Minoru; Ushimi, Kenji; and Ono, Akira, 4,327,275, Cl. 219-121.0LD.
Ono, Hiroki: *See*—
Ueda, Ikuo; Kobayashi, Masakazu; Yamada, Hisashi; and Ono, Hiroki, 4,327,093, Cl. 424-246.000.
Ono, Hiroshi: *See*—
Yoshimi, Toshikazu; and Ono, Hiroshi, 4,327,331, Cl. 330-126.000.
Ono, Junichi; Fukui, Isao; and Imamura, Naoki, to Shimadzu Seisakusho, Ltd. Method for emission spectrochemical analysis. 4,326,801, Cl. 356-313.000.
Ono, Takemitsu: *See*—
Iwao, Takayuki; Ono, Takemitsu; and Ishikawa, Yukio, 4,326,459, Cl. 101-93.300.
Ono, Takeo: *See*—
Asaoka, Sachio; Shiroto, Yoshimi; Nakamura, Munekazu; and Ono, Takeo, 4,326,991, Cl. 252-432.000.
Oranchak, William: *See*—
Gregory, Floyd A.; Manning, Donald F.; Oranchak, William; and Student, Joseph J., deceased, 4,326,656, Cl. 226-59.000.
Organization Control Services, Inc.: *See*—
Dorrance, William H., 4,327,239, Cl. 585-733.000.
Orvik, Jon A., to Dow Chemical Company, The. Process for reducing picoline derivatives using copper catalyst. 4,327,220, Cl. 546-345.000.
Oshima, Masanao; and Yashima, Nobuyoshi, to Mitsui Engineering and Shipbuilding Co., Ltd. Artificial island for installing oil drilling equipment in ice covered sea areas. 4,326,822, Cl. 405-217.000.
Ostrowski, Stanislaw. Helicopter rotor assembly and blade pitch control. 4,326,834, Cl. 416-134.00A.
Otto, Charles W., to General Electric Company. Methods of manufacturing a prime mover and a rotatable assembly therefore. 4,326,333, Cl. 29-598.000.
Ou-Yang, David T., to Minnesota Mining and Manufacturing Company. Shear-activated innerseal. 4,327,147, Cl. 156-69.000.
Oueneau, Paul E.; Richter, Horst J.; and Schuhmann, Reinhardt, Jr. Sprinkler burner for introducing particulate material and a gas into a reactor. 4,326,702, Cl. 266-267.000.
Outboard Marine Corporation: *See*—
Baltz, Gene F.; and Breckenfeld, Paul W., 4,327,041, Cl. 261-41.00B.
Overlach, Knud: *See*—
Kauer, Harald; Overlach, Knud; and Wilken, Joachim, 4,326,447, Cl. 89-41.00H.
Owens-Corning Fiberglas Corporation: *See*—
Kissell, Ronald E., 4,326,844, Cl. 432-13.000.
Oya, Akiyoshi: *See*—
Imamura, Akio; and Oya, Akiyoshi, 4,326,441, Cl. 84-1.030.
Oyaizu, Yoshijiro; Koike, Wataro; and Yazawa, Chihiro, to Ihara Chemical Industry Co., Ltd. Process for producing polyurethane elastomer by mixing a hardener composition with an isocyanate composition. 4,327,204, Cl. 528-61.000.
Ozaki, Sozaburo, to Hitachi, Ltd. Bearing device for rotary machines. 4,326,757, Cl. 308-121.000.
Ozu, Masao; Morita, Keiichi; and Itoh, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Refrigeration system utilizing a gaseous refrigerant bypass. 4,326,868, Cl. 62-324.600.
Pajak, Andrzej; Olszowski, Tadeusz; Mazur, Antoni, deceased (by Mazur, Irena, legal representative); Holtzer, Mariusz; Marzencki, Andrzej; and Jachowicz, Adam, to Instytut Odlewnictwa. Method for making foundry moulds and cores. 4,326,578, Cl. 164-15.000.
Pako Corporation: *See*—
Beer, Robert E.; and Anderson, Conrad V., 4,326,791, Cl. 354-321.000.
Palau, Joseph, to S.A. des Etablissements Staubli (France). Dobbies for forming the shed on weaving looms. 4,326,562, Cl. 139-68.000.
Palitex Project-Company GmbH: *See*—
Inger, Siegfried, 4,326,372, Cl. 57-88.000.
Pall Corporation: *See*—
Rosenberg, David J., 4,326,957, Cl. 210-436.000.
Pallaroni, Francesco; Baldini, Luciano; and Siccardi, Alberto, to Safta S.p.A.; and Bieffe S.P.A. Flexible container with valve. 4,326,574, Cl. 150-8.000.
Pampouchidis, Georg: *See*—
Leitner, Wolfgang; Pampouchidis, Georg; and Bleikolm, Anton, 4,327,200, Cl. 525-531.000.
Pandit, Madhukar: *See*—
Baier, Paul W.; Dostert, Klaus; Pandit, Madhukar; and Simons, Reinhard, 4,327,438, Cl. 375-1.000.
Papworth, Derek F., to Racal-Dana Instruments Limited. Electrical signal processing. 4,327,329, Cl. 328-144.000.
PaR Systems Corp.: *See*—
Neumeier, Karl E.; and Sullivan, Robert J., 4,326,937, Cl. 204-198.000.
Parg, Adolf: *See*—
Hamprecht, Gerhard; Parg, Adolf; and Koenig, Karl-Heinz, 4,327,034, Cl. 260-455.00A.
Pariani, Ronald L.: *See*—
Arp, David F.; and Pariani, Ronald L., 4,326,700, Cl. 266-219.000.
Parikh, Kedar D.: *See*—
Kadakia, Vinod K.; Jones, Glen D.; Parikh, Kedar D.; and Rider, Ronald E., 4,327,379, Cl. 358-261.000.
Paripovich, Michael D. Self-releasing locking unit for an inner spring assembly. 4,326,311, Cl. 5-475.000.
Park, Joon S.: *See*—
Deichert, William G.; Friends, Gary D.; Melpolder, John B.; and Park, Joon S., 4,327,203, Cl. 526-279.000.
Parker & Harper Mfg. Co.: *See*—
Massey, Roger G.; and Holloway, David G., 4,326,627, Cl. 200-47.000.
Parks-Cramer Company: *See*—
Soar, Brian, 4,326,371, Cl. 57-87.000.
Parry, James L.; Redden, Martin J.; and Goldstein, Albert, to ACCO Industries Inc. Anti-back up device for conveyor trolley. 4,326,466, Cl. 104-172.00S.
Pasini, Arnaldo; and Knirsch, Franco, to Ing. C. Olivetti & C., S.p.A. Non impact printer. 4,326,812, Cl. 400-121.000.
Pasko, Walter J.: *See*—
Ettinger, Robert H.; and Pasko, Walter J., 4,327,349, Cl. 336-219.000.
Pastorius, Walter J.: *See*—
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; Clarke, Donald A.; and Richards, Blaine, 4,326,808, Cl. 356-445.000.
Patanasinth, Kanit J.: *See*—
Puglia, Wayne J.; Patanasinth, Kanit J.; Lombardo, Andrew T.; Beam, John E.; and Mackay, Donald A. M., 4,327,076, Cl. 424-38.000.
Puglia, Wayne J.; Patanasinth, Kanit J.; Lombardo, Andrew T.; and Vink, Walter, 4,327,077, Cl. 424-38.000.
Patel, Mahendra R.: *See*—
Wong, Thomas M.; and Patel, Mahendra R., 4,327,080, Cl. 424-80.000.
Patel, Raman: *See*—
Coran, Aubert Y.; and Patel, Raman, 4,327,199, Cl. 525-176.000.
Patel, Rameshchandra S.; and Easley, Mark R., to NCR Corporation. Processor auto-recovery system. 4,327,410, Cl. 364-200.000.
Patentex, S.A: *See*—
LaCoste, Francois R., 4,326,716, Cl. 273-167.00R.
Pauwels, Edward M., to Bendix Corporation, The. Traction control brake energizer. 4,326,608, Cl. 188-181.00T.
Pavlov, Tengiz A.: *See*—
Moroz, Viktor M.; Lezin, Nikolai Y.; Pavlov, Tengiz A.; and Ilmensky, Vladimir V., 4,326,756, Cl. 308-3.900.
Pearson, David B.: *See*—
Ashkin, Arthur; Bjorkholm, John E.; Freeman, Richard R.; and Pearson, David B., 4,327,288, Cl. 250-251.000.
Pedall, Friedrich: *See*—
Edinger, Egon; and Pedall, Friedrich, 4,327,265, Cl. 219-10.410.
Peddie, Gerald D., to General Dynamics, Convair Division. Method for ultrasonically welding composite structures. 4,326,902, Cl. 156-73.100.

Peeler, Herbert T.: *See*—
Wolfrom, Glen W.; Williams, Robert D.; Peeler, Herbert T.; and Ivy, Richard E., 4,326,523, Cl. 128-260.000.
Peerless, Sidney A. Composite ventilation tube for the middle ear. 4,326,512, Cl. 128-151.000.
Pell, James W., Jr., to North American Philips Corporation. Acoustic impedance matching device. 4,326,418, Cl. 73-644.000.
Pellaux, Jean-Paul: *See*—
Bendit, Jean-Pierre; Pellaux, Jean-Paul; and Widmer, Georges, 4,326,870, Cl. 65-4.210.
Penird, Carl W.; and Puhak, Peter G., to North American Philips Consumer Electronics Corp. Shadow mask for color cathode ray tube. 4,327,307, Cl. 313-407.000.
PepsiCo Inc.: *See*—
Felix, Cristian J.; and Genaro, Donald M., 4,326,620, Cl. 194-1.00A.
Perham, Roscoe E. Kerf pressure plate material tester. 4,326,420, Cl. 73-768.000.
Perhay, John A.: *See*—
Axelgaard, Jens; Howson, David C.; and Perhay, John A., 4,326,534, Cl. 128-421.000.
Perlstein, Jerome H.: *See*—
Clark, Suzanne P.; Reynolds, George A.; and Perlstein, Jerome H., 4,327,169, Cl. 430-75.000.
Perraud, Raymond, to Societe d'Etude et de Construction de Machines pour Toutes Industries S.E.C.O.M.A., Societe Anonyme. Double acting hydraulic jack with an end of stroke device. 4,326,449, Cl. 91-401.000.
Perry, Robert H.: *See*—
Rush, Donald L.; Perry, Robert H.; and Rhoton, Richard S., 4,327,415, Cl. 364-436.000.
Persoon, Eric H. J., to U.S. Philips Corporation. Learning device for digital signal pattern recognition. 4,327,354, Cl. 340-146.3MA.
Peter, Cornelius: *See*—
Herth, Harro; Peter, Cornelius; and Schnurle, Hans, 4,326,488, Cl. 123-492.000.
Peters, Edward N., to Union Carbide Corporation. Poly(acrylate) containing compositions and process for producing molded articles. 4,327,013, Cl. 524-538.000.
Peters, Klaus-Jurgen: *See*—
Maisch, Wolfgang; Peters, Klaus-Jurgen; Wissmann, Michael; and Schelhas, Peter, 4,326,487, Cl. 123-453.000.
Petrolite Corporation: *See*—
Hendricks, Carl C.; Godar, Richard L.; and Roux, Kenneth R., 4,326,987, Cl. 252-392.000.
Phelps, Richard W.; and Tetro, Richard S., to Black Clawson Company, The. Method and apparatus for roll changing on a winder device. 4,326,679, Cl. 242-56.00A.
Philip Morris Incorporated: *See*—
Laszlo, Tibor S.; Nienow, John F.; Sherwood, John F.; and Irving, Christopher L., 4,326,542, Cl. 131-280.000.
Phillips Petroleum Company: *See*—
Cheng, Paul J., 4,327,069, Cl. 423-450.000.
Cox, Russell C., 4,326,327, Cl. 29-434.000.
Eastman, Alan D., 4,327,238, Cl. 585-661.000.
Mark, Harold W.; and Zuech, Ernest A., 4,326,990, Cl. 252-431.00C.
Nowack, Gerhard P.; and Johnson, Marvin M., 4,327,234, Cl. 585-267.000.
Salmon, Emigdio J., 4,327,050, Cl. 264-142.000.
Walker, Starnes E., 4,327,323, Cl. 324-61.00R.
Welch, Melvin B.; Dietz, Richard E.; and Capshew, Charles E., 4,326,988, Cl. 252-429.00B.
Pickles, Joseph; and Fudala, Chester S., to Ferro Manufacturing Corporation. Seat adjusting mechanism. 4,326,690, Cl. 248-396.000.
Pierce, John T., Jr.: *See*—
Clifford, Jack R., 4,326,893, Cl. 134-8.000.
Pilesi, William D.; and Trautmann, Harry J., to Koppers Company, Inc. Continuous proofloader. 4,326,421, Cl. 73-852.000.
Pilgrim Engineering Developments Limited: *See*—
Bunyan, Thomas W., 4,326,826, Cl. 411-339.000.
Pillow, Richard W.: *See*—
Guthrie, Phillip K.; and Pillow, Richard W., 4,326,706, Cl. 272-119.000.
Pioneer Electronic Corporation: *See*—
Okura, Keniti; and Nishikawa, Kazuo, 4,327,433, Cl. 369-139.000.
Yoshimi, Toshikazu; and Ono, Hiroshi, 4,327,331, Cl. 330-126.000.
Pipe, William J. C.; and Gray, John B. Method for cooling blocks of hot porous material. 4,326,384, Cl. 62-62.000.
Pipkin, David J., to International Business Machines Corporation. Method and apparatus for forming a coating on both sides of a substrate. 4,327,130, Cl. 427-209.000.
Pira, The Research Association for the Paper and Board, Printing and Packaging Industries: *See*—
Mollett, Christopher C., 4,326,912, Cl. 162-5.000.
Pitman-Moore, Inc.: *See*—
Guerrero, Jorge; Mellon, Alice D.; Fritz, Charles G.; and Doddi, Namassivaya, 4,326,522, Cl. 128-/260.000.
Plante, Robert A., to L.S. Starrett Company, The. Area comparison gage. 4,326,338, Cl. 33-174.0PA.
Plasek, Ronald E., to Schlumberger Technology Corp. Method and apparatus for nuclear well logging with optimized timing for simultaneous measurement of thermal neutron decay time and gamma ray pulse height spectra. 4,327,290, Cl. 250-262.000.
Plastiers Limited: *See*—
Edmondson, Ronald, 4,327,051, Cl. 264-318.000.
Plastipak Packaging Division, Beatrice Food Co.: *See*—
Nickel, Gerhard E. B.; and Darr, Richard C., 4,326,638, Cl. 215-12.00R.
Pleass, Charles M.: *See*—
Hicks, Douglas C.; and Pleass, Charles M., 4,326,840, Cl. 417-331.000.
Plotto, Michel, to Compagnie Internationale pour l'Informatique CII/-Honeywell Bull. Magnetic head slider assembly comprising at least one transducer for reading and/or recording information contained on a data carrier. 4,327,387, Cl. 360-103.000.
Poclain Hydraulics: *See*—
Bacquie, Serge B., 4,326,450, Cl. 91-487.000.
Pohl, Herbert A. Continuous dielectrophoretic cell classification method. 4,326,934, Cl. 204-180.00R.
Pole, Charles D., to Upper Lakes Shipping Ltd. Navigation in ice covered waterways. 4,326,476, Cl. 114-40.000.
Poler, Stanley, to Lynell Medical Technology, Inc. Intraocular lens and manipulating tool therefor. 4,326,306, Cl. 3-13.000.
Poler, Stanley. Method of making an intra-ocular lens-mount element. 4,327,171, Cl. 430-323.000.
Pollock, James F.: *See*—
Bentley, Peter D.; and Pollock, James F., 4,327,271, Cl. 219-85.00E.
Pond, Robert B., Sr.; and Winter, John M., Jr., to National-Standard Company. Method of forming a filament through melt extraction. 4,326,579, Cl. 164-461.000.
Ponsinet, Gerard: *See*—
Farge, Daniel; Leger, Andre; and Ponsinet, Gerard, 4,327,095, Cl. 424-250.000.
Pool, Daniel L. Device for dispensing fluent material from a collapsible container. 4,326,647, Cl. 222-103.000.
Portlandzementwerk Dotternhausen Rudolf Rohrbach Kommanditgellschaft: *See*—
Rohrbach, Gerhard; and Hollman, Bernd, 4,326,471, Cl. 110-341.000.
Posso, Patrick, to Gefitec S.A. Platform for photographic or cinematographic stand. 4,326,688, Cl. 248-178.000.
Postalia GmbH: *See*—
Nuckel, Klaus, 4,326,460, Cl. 101-110.000.
Potash, Hanan: *See*—
Genter, Melvyn E.; and Potash, Hanan, 4,327,355, Cl. 340-825.900.
Potter, Stanley B.: *See*—
Gibby, Richard A.; and Potter, Stanley B., 4,326,953, Cl. 210-168.000.
Powell, Robin F., to GKN Sankey Limited. Mechanical coupling assembly. 4,326,615, Cl. 192-93.00R.
PPG Industries, Inc.: *See*—
Cummings, Frances M., 4,326,924, Cl. 203-6.000.
Richter, Sidney B.; and Grove, William S., 4,326,882, Cl. 562-472.000.
Schimme, Karl F.; Seiner, Jerome A.; Christenson, Roger M.; and Dowbenko, Rostyslaw, 4,327,008, Cl. 524-104.000.
Pratley, Stuart K.: *See*—
Lips, Alexander; and Pratley, Stuart K., 4,326,965, Cl. 252-8.800.
Pratt, Paul L.: *See*—
Clifford, Jack R., 4,326,893, Cl. 134-8.000.
Preston, Joseph R., to RCA Corporation. High density information disc lubricants. 4,327,140, Cl. 428-65.000.
Price, Renata F., to United States of America, Army. Gusset discarding sabot munition. 4,326,464, Cl. 102-523.000.
Pritchard, Norman J.: *See*—
Bus, Jan; Mohlmann, Willem M. M.; and Pritchard, Norman J., 4,326,979, Cl. 252-158.000.
Produce Processors International Corporation: *See*—
Cashman, Richard J., 4,326,367, Cl. 54-2.000.
Product Technologies, Inc.: *See*—
Christison, Alan M., 4,327,398, Cl. 361-384.000.
Propper Manufacturing Co., Inc.: *See*—
Heine, Helmut A.; and Schmidt, Otto H., 4,327,317, Cl. 320-23.000.
Proskurina, Natalya A.: *See*—
Bukhtiyarov, Ivan D.; An, Viktor B.; Farshatov, Marat N.; Sapozhnikov, Fedor F.; Sidorov, Anatoly G.; Proskurina, Natalya A.; and Marakin, Vladimir I., 4,326,410, Cl. 73-117.300.
Pryor, Alvetta; and Ishibe, Nobuyuki, to Dow Chemical Company, The. Cyclopropane ring-containing compounds as inhibitor components in methylchloroform. 4,327,232, Cl. 570-108.000.
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Pudlosky, Joseph P., to RCA Corporation. Chuck for use in testing of semiconductor pellets. 4,327,325, Cl. 324-158.00F.
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Lowther, Frank E., 4,326,483, Cl. 123-3.000.
Q-dot Corporation: *See*—
Smith, David G., 4,326,344, Cl. 34-54.000.

Quinn, Robert L.: *See—*
Heyman, Philip M.; and Quinn, Robert L., 4,327,283, Cl. 235-487.000.
R.F.I. Inc.: *See—*
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R. J. Reynolds Tobacco Company: *See—*
Martin, Julian R.; and Sides, Larry W., 4,326,543, Cl. 131-362.000.
Racal-Dana Instruments Limited: *See—*
Papworth, Derek F., 4,327,329, Cl. 328-144.000.
Rachwal, Ervin J.: *See—*
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Rademaker, Gerrit, to U.S. Philips Corporation. Direct current telegraphy systems. 4,327,249, Cl. 178-3.000.
Radenkovic, Ljubomir. Solar energy collecting system. 4,326,502, Cl. 126-439.000.
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Lis, Steven A.; Serreze, Harvey B.; and Sienkiewicz, Peter M., 4,327,119, Cl. 427-74.000.
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Fomenko, Joseph; Kuecken, John A.; and Sloboda, James J., 4,327,251, Cl. 179-1.0SM.
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Ralston, Paul H.: *See—*
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Rambo, George E.: *See—*
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Drake, James F., Jr.; and Rambosek, G. Phillip, 4,326,524, Cl. 128-260.000.
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Ramlow, Gerhard G.; Heyman, Duane A.; and Moore, Richard A., to BASF Wyandotte Corporation. Process for the preparation of stabilized polymer dispersions in polyol at low temperature. 4,327,005, Cl. 524-377.000.
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Hawes, Richard J., 4,326,593, Cl. 172-226.000.
Rapier, Pascal M., to United States of America, Energy. Direct contact, binary fluid geothermal boiler. 4,326,581, Cl. 165-45.000.
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Rappleyea, Frederick A., to Kendall Company, The. Protective headgear. 4,326,303, Cl. 2-411.000.
Rasmus, Adam M. Anti-friction bearing. 4,326,759, Cl. 308-183.000.
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Micetich, Ronald G.; Shaw, Chia-Cheng; and Rastogi, Ram B., 4,327,222, Cl. 548-247.000.
Rathmell, Richard K. Apparatus and method for recovering volatile compounds. 4,326,343, Cl. 34-51.000.
Ray, Ranjan, to Allied Chemical Corporation. Apparatus for making metallic glass powder. 4,326,841, Cl. 425-8.000.
Raychem Corporation: *See—*
Walker, Jack M., 4,327,351, Cl. 338-22.00R.
Raytheon Company: *See—*
Bostwick, Lewis S.; Filosa, Albert V.; and LaTorre, Richard R., 4,326,428, Cl. 74-5.00F.
Daly, Kevin R., 4,327,277, Cl. 219-121.0LD.
Geier, Leonard W.; and Dunn, Kenneth F., 4,326,503, Cl. 126-443.000.
Keene, Wayne H.; and Jelalian, Albert V., 4,326,799, Cl. 356-152.000.
RCA Corporation: *See—*
Balaban, Alvin R.; and Steckler, Steven A., 4,327,376, Cl. 358-159.000.
Chambers, Robert W.; and Cuomo, Frank, Jr., 4,326,325, Cl. 29-27.00C.
Christopher, Todd J., 4,327,434, Cl. 369-220.000.
Demers, Robert R., 4,326,494, Cl. 125-12.000.
Dieterich, Charles B.; and Lang, Frank B., 4,327,431, Cl. 369-126.000.
Hall, William B., 4,326,553, Cl. 134-153.000.
Heyman, Philip M.; and Quinn, Robert L., 4,327,283, Cl. 235-487.000.
Kessler, Sebastian W., Jr., 4,327,370, Cl. 357-79.000.
Lang, Frank B.; and Clemens, Jon K., 4,327,432, Cl. 369-126.000.
Levine, Aaron W.; Tomeczek, Kazimiera D.; and Harper, Stanley A., 4,327,123, Cl. 427-64.000.
Malchow, Max E., 4,327,332, Cl. 330-261.000.
McNeely, Michael L., 4,327,047, Cl. 264-107.000.
Nyman, Frederick R.; Stevens, Barry; and Calamari, James A., Jr., 4,327,048, Cl. 264-107.000.
Preston, Joseph R., 4,327,140, Cl. 428-65.000.
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Redden, Martin J.: *See—*
Parry, James L.; Redden, Martin J.; and Goldstein, Albert, 4,326,466, Cl. 104-172.00S.
Reed, Kingstone L. H.; and Hatcher, Ian, to Koolatron Industries, Ltd. Compact thermoelectric refrigerator. 4,326,383, Cl. 62-3.000.
Reed, Robert D., to United States of America, National Aeronautics and Space Administration. Sun-sensing guidance system for high-altitude aircraft. 4,326,685, Cl. 244-175.000.
Reed, Terry J.: *See—*
Smith, Jack R.; and Reed, Terry J., 4,327,294, Cl. 290-40.00C.
Reeves, John E.: *See—*
Gant, Robert C.; and Reeves, John E., 4,326,411, Cl. 73-155.000.
Regan Offshore International, Inc.: *See—*
Watkins, Bruce J., 4,326,328, Cl. 29-464.000.
Watkins, Bruce J., 4,326,584, Cl. 166-82.000.
Reiffen, Manfred: *See—*
Austel, Volkhard; Reiffen, Manfred; Heider, Joachim; and Diederen, Willi, 4,327,100, Cl. 424-256.000.
Reilly, Phillip B.; and Ralston, Paul H., to Calgon Corporation. Process for the manufacture of fused polyphosphate glasses. 4,326,873, Cl. 65-134.000.
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Montavon, Marc; and Reiner, Roland, 4,327,210, Cl. 544-027.000.
Reitz, Ronald P. Electrochemical storage cell device. 4,327,161, Cl. 429-110.000.
Rempfler, Hermann, to Ciba-Geigy Corporation. Derivatives of 5-(pyridyl-2-oxy)-2-nitrobenzoic acid, and herbicidal compositions containing them, and herbicidal methods for using same. 4,326,880, Cl. 71-94.000.
Remus, Casimer F., to Bendix Corporation, The. Synchro. 4,327,347, Cl. 336-120.00C.
Rentzea, Costin; Sauter, Hubert; and Jung, Johann, to BASF Aktiengesellschaft. Substituted alkylammonium salts, the manufacture thereof, the use thereof for regulating plant growth, and agents therefor. 4,327,214, Cl. 546-133.000.
Reschly, David C., to Detroit Stoker Company. Multi-fuel feeder distributor. 4,326,469, Cl. 110-115.000.
Revell, Alan, to American Air Filter Company, Inc. Discharge apparatus for removing granular filter material from a filter housing and a filter apparatus having same. 4,326,866, Cl. 55-479.000.
Rexham Corporation: *See—*
Burton, Charles A.; and Russell, Robert C., 4,326,568, Cl. 141-114.000.
Reymersdal, Joseph V.; and Cooper, John H., to Sperry Corporation. Magnetic bubble transducer. 4,327,423, Cl. 365-8.000.
Reynolds, George A.: *See—*
Clark, Suzanne P.; Reynolds, George A.; and Perlstein, Jerome H., 4,327,169, Cl. 430-75.000.
Rhone-Poulenc Industries: *See—*
Dromard, Adrien; and Ramanadin, 4,327,191, Cl. 521-31.000.
Farge, Daniel; Leger, Andre; and Ponsinet, Gerard, 4,327,095, Cl. 424-250.000.
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Rhone-Poulenc-Textile: *See—*
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Rice, Frank L.: *See—*
White, James A.; Rice, Frank L.; and Lewis, Walter E., 4,327,274, Cl. 219-10.55R.
Rich, Elvis: *See—*
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Richard, Francoise: *See—*
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Richards, Blaine: *See—*
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Richter, Horst J.: *See—*
Oueneau, Paul E.; Richter, Horst J.; and Schuhmann, Reinhardt, Jr., 4,326,702, Cl. 266-267.000.
Richter, Sidney B.; and Grove, William S., to PPG Industries, Inc. Trichlorophenoxy alkanoic acid free of chlorinated dibenzo-p-dioxins. 4,326,882, Cl. 562-472.000.
Ricketts, Thomas E., to Occidental Oil Shale Inc. Blasting to a horizontal free face with mixing of fragments. 4,326,751, Cl. 299-2.000.
Ricketts, Thomas E., to Occidental Oil Shale, Inc. Method for forming an in situ oil shale retort. 4,326,752, Cl. 299-13.000.
Ricoh Co., Ltd.: *See—*
Hashimoto, Mitsuru, 4,327,168, Cl. 430-57.000.
Sasaki, Masaomi; Ohta, Masafumi; and Tsutsui, Kyoji, 4,327,020, Cl. 260-160.000.
Suzuki, Toshitatsu, 4,327,284, Cl. 250-204.000.
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Rider, Ronald E.: *See—*
Kadakia, Vinod K.; Jones, Glen D.; Parikh, Kedar D.; and Rider, Ronald E., 4,327,379, Cl. 358-261.000.
Riebel, Hans-Jochem: *See—*
Jautelat, Manfred; Arlt, Dieter; Lantzsch, Reinhard; Fuchs, Rainer; Riebel, Hans-Jochem; Schroder, Rolf; and Harnisch, Horst, 4,327,025, Cl. 260-338.000.
Riedel-de Haen Aktiengesellschaft: *See—*
Stahl, Otto; and Schulz, Horst, 4,326,639, Cl. 215-252.000.
Riedel, Tilo H., to Sesamat Anstalt. Lever-operable fastener for a shoe. 4,326,320, Cl. 24-70.0SK.
Ripley, Robert H.; Karsten, Robert W.; Brandon, Eugene M.; and Lockerby, James W., to Century Inks Corporation. Printing ink and vehicle therefor. 4,327,011, Cl. 524-474.000.
Ristovski, Djoko: *See—*
Ristovski, Ilija, 4,326,763, Cl. 339-14.00P.
Ristovski, Ilija, to Ristovski, Djoko. Electrical plug. 4,326,763, Cl. 339-14.00P.
Rittmaster, Peter A.; and Booth, John L. Hydraulic engine. 4,326,380, Cl. 60-595.000.
Robbins, E. H.: *See—*
Baardson, Andrew B., 4,326,382, Cl. 60-655.000.
Robert Bosch GmbH: *See—*
Edel, Harry; and Lange, Wolfgang, 4,326,689, Cl. 248-359.000.
Herden, Werner, 4,326,419, Cl. 73-708.000.
Herth, Harro; Peter, Cornelius; and Schnurle, Hans, 4,326,488, Cl. 123-492.000.
Maisch, Wolfgang; Peters, Klaus-Jurgen; Wissmann, Michael; and Schelhas, Peter, 4,326,487, Cl. 123-453.000.
Mezger, Manfred; Leussink, Reinhard; and Fritz, Adolf, 4,326,486, Cl. 123-418.000.
Roberts, Hill W.: *See—*
Thompson, Phillip B.; and Roberts, Hill W., 4,326,599, Cl. 181-175.000.
Roberts, Thomas G., to United States of America, Army. Nuclear activated cw chemical laser. 4,327,338, Cl. 372-89.000.
Robinson, Ken K.: *See—*
Meyer, James S.; Robinson, Ken K.; Forgac, John M.; and Tatterson, David F., 4,326,944, Cl. 208-8.00R.
Rock, Gregory, to Arnhem, Erik M. Mud guard. 4,326,727, Cl. 280-154.50R.
Rockwell International Corporation: *See—*
Hoss, Robert J., 4,327,362, Cl. 340-870.020.
Jaqua, Vance W., 4,326,377, Cl. 60-247.000.
Jones, Addison B., 4,326,936, Cl. 204-192.00E.
Molina, Orlando G., 4,326,981, Cl. 252-301.190.
Moore, Richard L., 4,327,364, Cl. 343-18.00A.
Rosman, Irwin E.; and Wagner, William R., 4,326,582, Cl. 165-83.000.
Roe, George W., to McDonnell Douglas Corporation. Launch environment simulator. 4,326,847, Cl. 434-12.000.
Roether, Kurt: *See—*
Carneim, Wilfried; Hillemanns, Herbert; Vollmecke, Hermann; Ribken, Hans; Schumacher, Heinz; and Roether, Kurt, 4,326,699, Cl. 266-114.000.
ROHCO Incorporated: *See—*
Eckles, William E.; Bishop, Craig V.; and Vaitekunas, Peter T., 4,326,940, Cl. 204-232.000.
Rohrbach, Gerhard; and Hollman, Bernd, to Portlandzementwerk Dotternhausen Rudolf Rohrbach Kommanditgellschaft. Process for the carbonization of oil shale and other carbonizable materials. 4,326,471, Cl. 110-341.000.
Rolls-Royce Limited: *See—*
Nightingale, Douglas J., 4,326,682, Cl. 244-54.000.
Roocroft, Syd: *See—*
Dolan, John J.; and Roocroft, Syd, 4,327,044, Cl. 264-36.000.
Rose, Neil M., to Canica Crushers, Ltd. Reciprocating infeed tube for centrifugal impact rock crusher. 4,326,676, Cl. 241-275.000.
Rosen, Harold A., to Hughes Aircraft Company. Spacecraft with internal propulsion stages. 4,326,684, Cl. 244-158.00R.
Rosenbaum, Glen F., to CMI Corporation. Gate assembly and control assembly therefor. 4,326,750, Cl. 298-35.00M.
Rosenberg, David J., to Pall Corporation. Vented filter spigot for intravenous liquid administration apparatus. 4,326,957, Cl. 210-436.000.
Rosenkrantz, Bernard E.; and Stupak, Elliot, to Schering Corporation. Stabilized Netilmicin formulations. 4,327,087, Cl. 424-180.000.
Roske, Dieter, to Haendler & Natermann GmbH. Aluminum foil label for bottles. 4,326,350, Cl. 40-310.000.
Rosman, Irwin E.; and Wagner, William R., to Rockwell International Corporation. Single element tube row heat exchanger. 4,326,582, Cl. 165-83.000.
Ross, William L., to Sign Electronics Limited. Printing apparatus. 4,326,458, Cl. 101-1.000.
Rossi, Alberto: *See—*
Sele, Alex; Ferrini, Pier G.; Haas, Georges; Jaeggi, Knut A.; and Rossi, Alberto, 4,327,091, Cl. 424-246.000.
Rossmann, Axel, to Motoren- und Turbinen-Union Muenchen GmbH. High-strength components of complex geometric shape and method for their manufacture. 4,327,154, Cl. 428-545.000.
Roth, Jurgen: *See—*
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Roux, Kenneth R.: *See—*
Hendricks, Carl C.; Godar, Richard L.; and Roux, Kenneth R., 4,326,987, Cl. 252-392.000.
Roux, Steven J. Hand held restraining cutter. 4,326,334, Cl. 30-124.000.
Rubalcava, Carlos A. Hydro-pneumatic suspensions for automotive vehicles. 4,326,733, Cl. 280-708.000.
Rubin, David; and Rubin, David, to Schwimmer, Adolf W.; and Schwartz, Erwin S. Method for diagnosis and selective treatment of infections of bacteria having β-glucuronidase activity. 4,327,074, Cl. 424-1.500.
Rubin, David: *See—*
Rubin, David; and Rubin, David, 4,327,074, Cl. 424-1.500.
Rubio, Manuel J. Continuous production of grain products. 4,326,455, Cl. 99-483.000.
Rudd, Wallace C., to Thermatool Corporation. Heat exchanger panels. 4,326,583, Cl. 165-183.000.
Rudy, Jerome; and Rapisarda, Anthony A., to Lever Brothers Company. Additives for clothes dryers. 4,327,133, Cl. 427-242.000.
Ruhe, Anthony; Chitty, John A.; and Nickerson, James H. D. Post weld heat treatment of shell and tube heat exchangers and apparatus. 4,326,897, Cl. 148-13.100.
Runfree Enterprise, Inc.: *See—*
Leibrand, John G., Sr.; and Bessey, Marlin L., 4,326,492, Cl. 123-557.000.
Runge, Thomas M. Fan jet engine bypass air delivery system for blown wing aircraft lift augmentation device. 4,326,686, Cl. 244-207.000.
Ruof, Edgar J., to Goodyear Aerospace Corporation. Automatic brake control circuit for aircraft. 4,327,413, Cl. 364-426.000.
Rush, Donald L.; Perry, Robert H.; and Rhoton, Richard S., to Westinghouse Electric Corp. Transit vehicle handback control apparatus and method. 4,327,415, Cl. 364-436.000.
Russell, Robert C.: *See—*
Burton, Charles A.; and Russell, Robert C., 4,326,568, Cl. 141-114.000.
Russo, Carl J.: *See—*
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Rutt, Donald R.: *See—*
Stetter, Joseph R.; and Rutt, Donald R., 4,326,927, Cl. 204-1.00T.
Ryan, James W.; and Chung, Alfred, to University of Miami. Urinary kallikrein assay: specific substrates and assay method. 4,327,178, Cl. 435-23.000.
Ryan, Lenore S.; Murray, Frank C.; Sprangers, Ann M.; Santoski, William J.; Sciaraffa, Michael A.; Abel, Kent W.; and Donnelly, Harold F., to Kimberly-Clark Corporation. Elastic legged diapers. 4,326,528, Cl. 128-287.000.
Rybicki, Edward B.; and Sussman, Milton H., to American Optical Corporation. 10× Microscope objective. 4,326,779, Cl. 350-414.000.
Rymarenko, Leonid I.: *See—*
Davydov, Vadim A.; Khromov, Vladimir I.; Makeev, Igor M.; Kogos, Aizik M.; and Rymarenko, Leonid I., 4,326,400, Cl. 72-280.000.
Rynik, Jan. Advance mechanism, preferably for mining machines. 4,326,753, Cl. 299-43.000.
Sabase, Makoto; and Sakaitani, Mario, to Matsushita Industry Co., Ltd. Apertured plate with adjustable-constriction member for providing shiftable bottom wall of hopper for granular material that is juxtaposed upon a plurality of metering compartments. 4,326,651, Cl. 222-439.000.
Sabatka, Winston E.; and Bloomquist, Wilburn M., to Finishing Equipment, Inc. Electro-chemical deburring method. 4,326,933, Cl. 204-129.600.
Sadler, Thomas H., to Manville Service Corporation. Crystalline calcium carbonate as a diluent in hydrothermally cured hydraulic cement compositions. 4,326,891, Cl. 106-99.000.
Safta S.p.A.: *See—*
Pallaroni, Francesco; Baldini, Luciano; and Siccardi, Alberto, 4,326,574, Cl. 150-8.000.
Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, to Toyama Chemical Co., Ltd. Novel penicillins. 4,327,097, Cl. 424-250.000.
Saito, Eiichi: *See—*
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Saito, Tutomu; and Yamaguchi, Ryoji, to Tokyo Shibaura Denki Kabushiki Kaisha. Laser scanning apparatus. 4,327,287, Cl. 250-234.000.
Saito, Yasunori, to Sumitomo Electric Industries, Ltd. Method for controlling gas pressure sealed in coaxial communication cable. 4,327,242, Cl. 174-11.00R.
Saito, Zyunso: *See—*
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Sakata, Kazuhiro: *See—*
Kuzunuki, Soshiro; Hirasawa, Kotaro; Sakata, Kazuhiro; and Yoneda, Kenji, 4,326,606, Cl. 187-29.00R.

Sakurai, Takeyoshi; and Kobayashi, Noboru, to Mitsubishi Denke Kabushiki Kaisha. Switching device. 4,327,263, Cl. 200-148.00A.

Sala, Franco, to Steelyamamoto International Company Ltd. Device for automatically reducing excess play in movable parts of brakes. 4,326,609, Cl. 188-196.0BA.

Salee, Gideon, to Hooker Chemicals & Plastics Corp. Polymer blends with improved hydrolytic stability. 4,327,012, Cl. 523-203.000.

Salle, Jacques E.: *See*—
Athenes, Claude; Salle, Jacques E.; and Blouin, Philippe, 4,327,442, Cl. 375-119.000.

Salm, Dieter: *See*—
Schippers, Heinz; Schimmels, Bernd; and Salm, Dieter, 4,326,677, Cl. 242-18.0DD.

Salmon, Emigdio J., to Phillips Petroleum Company. Extrusion and pelleting apparatus and method. 4,327,050, Cl. 264-142.000.

Sander, Jurgen; and Horn, Klaus, to Hoechst Aktiengesellschaft. Photopolymerizable unsaturated polyesters and copying material prepared therewith. 4,327,170, Cl. 430-285.000.

Sanders Associates, Inc.: *See*—
Burrows, James L., 4,327,407, Cl. 364-200.000.

Sanders, James M.: *See*—
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,326,998, Cl. 252-522.00R.

Sandoz, Inc.: *See*—
Spencer, Homer K.; and Graben, Melvin M., 4,326,879, Cl. 71-94.000.

Sands, John L.: *See*—
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Sanemitsu, Yuzuru: *See*—
Mizutani, Masato; Tsushima, Kazunori; Sanemitsu, Yuzuru; and Hirano, Masachika, 4,327,094, Cl. 424-249.000.

Sanfilippo, Aurora: *See*—
Marsili, Leonardo; Franceschi, Giovanni; and Sanfilippo, Aurora, 4,327,096, Cl. 424-250.000.

Sangamo Weston, Inc.: *See*—
Jerrim, John W., 4,327,416, Cl. 364-481.000.

Sankyo Electric Company Limited: *See*—
Tamura, Yasushi, 4,326,386, Cl. 62-150.000.

Santoski, William J.: *See*—
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Sanyei Corporation: *See*—
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Sanyo Electric Co., Ltd.: *See*—
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Bukhtiyarov, Ivan D.; An, Viktor B.; Farshatov, Marat N.; Sapozhnikov, Fedor F.; Sidorov, Anatoly G.; Proskurina, Natalya A.; and Marakin, Vladimir I., 4,326,410, Cl. 73-117.300.

Sarot, Pierre: *See*—
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Sasaki, Etsuro; and Ohsaki, Takaaki, to Nippon Telegraph & Telephone Public Corp. Heat pipe cooling arrangement for integrated circuit chips. 4,327,399, Cl. 361-385.000.

Sasaki, Keiichi: *See*—
Chikata, Tsukasa; Sunami, Yoshihiko; Sasaki, Keiichi; and Nishioka, Kunihiko, 4,326,946, Cl. 208-93.000.

Sasaki, Masaomi; Ohta, Masafumi; and Tsutsui, Kyoji, to Ricoh Company, Ltd. Bis-azo compounds. 4,327,020, Cl. 260-160.000.

Sather, George A. Can crushing apparatus. 4,326,457, Cl. 100-218.000.

Sato, Eiji; Arai, Nobukatsu; Tanaka, Hideki; Fukushima, Toshihiko; and Nakajima, Tadakatsu, to Hitachi, Ltd. Rankine-cycle-engine-driven cooling-and-heating system. 4,326,391, Cl. 62-402.000.

Sato, Masaaki, to Olympus Optical Co., Ltd. Magnetic recording-reproducing apparatus. 4,326,659, Cl. 226-190.000.

Sauer, Donald G., to National Can Corporation. Process for making containers. 4,327,052, Cl. 264-512.000.

Sauer, Walter. Feeding apparatus for small animals. 4,326,482, Cl. 119-52.00B.

Saurenman, Donald G., to Consan Pacific Incorporated. Ion treatment enhancement. 4,326,454, Cl. 99-451.000.

Sauter, Hubert: *See*—
Rentzea, Costin; Sauter, Hubert; and Jung, Johann, 4,327,214, Cl. 546-133.000.

Savin Corporation: *See*—
Landa, Benzion, 4,326,644, Cl. 221-263.000.
Landa, Benzion, 4,326,792, Cl. 355-3.0TR.

Sawa, Yuji; Endo, Shigeru; and Uehara, Tsutomu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Multilayered hollow container. 4,327,137, Cl. 428-35.000.

Sawyer, Willard H.; and Cull, Neville L., to Exxon Research & Engineering Co. Hydrocracking over alumina-aluminum fluorophosphate-containing catalysts. 4,326,947, Cl. 208-111.000.

Sbicca, Peter J. Article of footwear. 4,326,345, Cl. 36-135.000.

Scalesciani, Juan B. A. Amino-penicillin derivative, and therapeutic composition containing the same. 4,327,105, Cl. 424-271.000.

Schacht, Ezra L. Combination of electrical meter socket column and panelboard for conversion to individual tenant metering. 4,327,396, Cl. 361-379.000.

Schaefer, Dieter; Motz, Herbert; Mayer, Dieter; Deigner, Paul; Hack, Joachim; and Falk, Roland, to BASF Aktiengesellschaft. Rigid magnetic recording disk having perfluoropolyether lubricant. 4,327,139, Cl. 428-65.000.

Schaefer, Jean E.: *See*—
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Schaffer, Robert R.; and Skinner, Dean W., to International Business Machines Corporation. Document printing device having a platen with character segments thereon. 4,326,814, Cl. 400-125.100.

Schafter, William; and Bradley, Terrag W., to Hewlett-Packard Company. Flexible low friction platen cover for recording apparatus. 4,327,366, Cl. 346-76.0PH.

Scheinpflug, Hans: *See*—
Timmler, Helmut; Buchel, Karl; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,327,104, Cl. 424-269.000.

Schelhas, Peter: *See*—
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Schenkenberger, Ernst: *See*—
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Scher, Herbert I.; and Ungar, Israel S., to Nevamar Corporation. Abrasion-resistant laminate. 4,327,141, Cl. 428-148.000.

Schering Corporation: *See*—
Rosenkrantz, Bernard E.; and Stupak, Elliot, 4,327,087, Cl. 424-180.000.

Schillerstrom, Merl S.; and Tufts, Robert A., to Deere & Company. Apparatus for checking the spindle plane on a cotton harvester. 4,326,369, Cl. 56-41.000.

Schilling, Robert: *See*—
Strugala, Alfred; Schilling, Robert; and Adamaszek, Dieter, 4,326,397, Cl. 72-110.000.

Schillinger, Joseph F.; Bicksler, William B.; and Lambert, Herbert L., to Champion International Corporation. Sealed beam headlight carton. 4,326,633, Cl. 206-418.000.

Schimme, Karl F.; Seiner, Jerome A.; Christenson, Roger M.; and Dowbenko, Rostyslaw, to PPG Industries, Inc. Urethane rheology modifiers and coating compositions containing same. 4,327,008, Cl. 524-104.000.

Schimmels, Bernd: *See*—
Schippers, Heinz; Schimmels, Bernd; and Salm, Dieter, 4,326,677, Cl. 242-18.0DD.

Schippers, Heinz; Schimmels, Bernd; and Salm, Dieter, to Barmag Barmer Maschinenfabrik. Monitoring circuit for high speed spindle assembly. 4,326,677, Cl. 242-18.0DD.

Schlaich, Jorg: *See*—
Leonhardt, Fritz; Andra, Wolfhart; Zellner, Wilhelm; Schlaich, Jorg; and Mayr, Gunter, 4,326,363, Cl. 52-80.000.

Schleicher, Hermann; and Vogel, Norbert, to Hermann Schleicher GmbH & Co. Pallet formed of folded profiled metal sheet. 4,326,467, Cl. 108-51.100.

Schleicher, Robert G.: *See*—
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Schlosberg, Richard H., to Exxon Research & Engineering Co. Oxygen alkylation of phenol-containing hydrocarbonaceous streams. 4,326,949, Cl. 208-263.000.

Schlueter, Ernest, to Simmons Fastener Corporation. Fastener with pivotable handle member. 4,326,739, Cl. 292-247.000.

Schlumberger Limited: *See*—
Timmons, John P., 4,327,412, Cl. 364-422.000.

Schlumberger Technology Corporation: *See*—
Garcia, Jose B.; and Bosse-Platiere, Michel J., 4,326,462, Cl. 102-310.000.
Plasek, Ronald E., 4,327,290, Cl. 250-262.000.

Schmeling, Gerhard: *See*—
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Schmid, Franziska, deceased: *See*—
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Schmid, Hans, heir: *See*—
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Schmid, Rolf: *See*—
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Schmidt, Adolf; and Bockmann, August, to Bayer Aktiengesellschaft. Aqueous dispersions of plastics in which the average diameter of the dispersion particles is in the range from about 50 to 500 nm, and a process for their preparation. 4,327,004, Cl. 524-745.000.

Schmidt-Hatting, Wolfgang, to Swiss Aluminium Ltd. Anode support system for a molten salt electrolytic cell. 4,326,939, Cl. 204-228.000.

Schmidt, Manfred: *See*—
Uerpmann, Ernst-Peter; Staupendahl, Gerhard; and Schmidt, Manfred, 4,326,820, Cl. 405-128.000.

Schmidt, Otto H.: *See*—
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Schmieder, Frank: *See*—
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Schmitt, Frederick L.: *See*—
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Schmolka, Irving R., to BASF Wyandotte Corporation. Liquid antiseptic cleaners with improved foaming properties. 4,326,977, Cl. 252-106.000.
Schmuck, Guenter E.: *See*—
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Schnurle, Hans: *See*—
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Schoeller, Felix, Jr.: *See*—
von Meer, Walter, 4,327,174, Cl. 430-530.000.
Schofield, Clive; and Miles, John E. P., to National Research Development Corporation. Mixing devices. 4,326,810, Cl. 366-106.000.
Schregenberger, Alex J., to Midland-Ross Corporation. Multi-zone oven with cool air modulation. 4,326,342, Cl. 34-47.000.
Schreiber, Werner, to Ciba-Geigy Corporation. Process for the production of dibenzazolyl compounds. 4,327,209, Cl. 542-466.000.
Schreier, Ulrich: *See*—
Miltenberger, Charles W.; Lucas, Edward J.; and Schreier, Ulrich, 4,326,872, Cl. 65-112.000.
Schroder, Rolf: *See*—
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Schuder, Maurice E.; and Stafford, Richard W., to Emhart Industries, Inc. Timing mechanism. 4,327,259, Cl. 200-38.00A.
Schuhmann, Reinhardt, Jr.: *See*—
Oueneau, Paul E.; Richter, Horst J.; and Schuhmann, Reinhardt, Jr., 4,326,702, Cl. 266-267.000.
Schultz, Kenneth E.; and Craycraft, Mary. Intracatheter-intravenous tubing lock. 4,326,516, Cl. 128-214.00R.
Schulz, Horst: *See*—
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Schulz, Volker; Kunke, Stefan; and Heim, Ulrich, to Dragerwerk AG. Patient data controlled respiration system. 4,326,513, Cl. 128-203.140.
Schumacher, Heinz: *See*—
Carneim, Wilfried; Hillemanns, Herbert; Vollmecke, Hermann; Ribken, Hans; Schumacher, Heinz; and Roether, Kurt, 4,326,699, Cl. 266-114.000.
Schuster, Michael M.: *See*—
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Schwartz, Leslie H. Alignment device for electro-acoustical transducers. 4,327,257, Cl. 179-115.50R.
Schwartz, Samuel. Key and lock core combination. 4,326,761, Cl. 312-326.000.
Schwarz, Arthur M., to Inland Steel Company. Process for deoiling and agglomerating oil-bearing mill scale. 4,326,883, Cl. 75-5.000.
Schwimmer, Adolf W.: *See*—
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Scianna, Anthony, Sr.; and Gordon, Frank J., to Motorola Inc. Combined cassette tape guide and tape stripper. 4,326,660, Cl. 226-190.000.
Sciaraffa, Michael A.: *See*—
Ryan, Lenore S.; Murray, Frank C.; Sprangers, Ann M.; Santoski, William J.; Sciaraffa, Michael A.; Abel, Kent W.; and Donnelly, Harold F., 4,326,528, Cl. 128-287.000.
Scott, Michael A.: *See*—
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Scott Paper Company: *See*—
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Scott, Raymond G., to Champion International Corporation. Gift package sleeve. 4,326,665, Cl. 229-87.00R.
Scribner, Belding H.: *See*—
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Johnson, Steven A.; and Seader, Junior D., 4,327,184, Cl. 435-287.000.
Sears, Roebuck and Co.: *See*—
Gall, John C.; and Meharg, Richard D., 4,326,732, Cl. 280-642.000.
SECIM: *See*—
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Seidel, Martin P.: *See*—
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Seimiya, Motoo, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of preparing silicon carbide. 4,327,066, Cl. 423-345.000.
Seiner, Jerome A.: *See*—
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Sele, Alex; Ferrini, Pier G.; Haas, Georges; Jaeggi, Knut A.; and Rossi, Alberto, to Ciba-Geigy Corporation. N,N-Di and N,N,N-tri(hydroxy-lower alkyl) ammonium salts of substituted 3,4-dihydro-2H-1,2-benzothiazine 1,1 dioxide and pharmaceutical compositions thereof. 4,327,091, Cl. 424-246.000.
Seliger, Robert L.: *See*—
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Senni, Paolo; and Astarita, Domenico, to SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Process for the purification of caprolactame. 4,326,925, Cl. 203-37.000.
Senuma, Michio, to Canon Kabushiki Kaisha. Magnetized shutter blades. 4,326,787, Cl. 354-246.000.
Seoka, Yoshio: *See*—
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Sepp, Gunther, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Method of making laser beam optical decoupling element for an astable laser resonator. 4,327,129, Cl. 427-164.000.
Serreze, Harvey B.: *See*—
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Shaffer, Mark A.; and Baker, Frank J., II. Endotracheal tube retainer. 4,326,515, Cl. 128-207.170.
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Minezaki, Shigehiro; Takamatsu, Toshiaki; and Kozaki, Shuichi, 4,326,929, Cl. 204-15.000.
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Sheldon, Loren B., to BJ-Hughes Inc. Apparatus for sensing a distended location on a drill pipe. 4,327,261, Cl. 200-61.410.
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Sherrick, James W.; and Casbohm, Chris E., to Lord Corporation. Adjustable spring clip. 4,326,670, Cl. 238-341.000.
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Shigeyasu, Motoo; and Kitamura, Takehiko, to Matsuyama Petrochemicals Inc. Process and apparatus for producing aromatic dicarboxylic acids. 4,327,226, Cl. 562-416.000.
Shigihara, Takanori: *See*—
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Shim, Jaewon L.: *See*—
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Shimonaka, Hideki, to Olympus Optical Co., Ltd. Device for operating a coeliac tubular member-closing implement. 4,326,531, Cl. 128-326.000.
Shin-Kobe Electric Machinery Co., Ltd.: *See*—
Mituhashi, Kazuyuki; Matumoto, Kunio; Shirai, Haruo; and Tanaka, Yoshikatu, 4,327,247, Cl. 174-68.500.
Shinagawa, Mutsuaki: *See*—
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Shinma, Nobuo; Umeda, Isao; Ishitsuka, Hideo; and Suhara, Yasuji, to Hoffmann-La Roche Inc. Phosphonooxy- or glycosyloxy-substituted acrylophenones, compositions and uses thereof. 4,327,088, Cl. 424-180.000.
Shinno, Kiyonori. Method for lining of inner surface of a pipe. 4,327,132, Cl. 427-235.000.
Shinwa Audio Company, Ltd.: *See*—
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Shionogi & Co., Ltd.: *See—*
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Shirai Eenshi Kogyo Co., Ltd.: *See—*
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Shirai, Haruo: *See—*
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Shiroto, Yoshimi: *See—*
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Shoji, Masami: *See—*
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Shrimpton, Wallace. Method and means for controlling the sex of mammalian offspring and product therefor. 4,327,177, Cl. 435-2.000.
Shroyer, Larry L., to Ener-Tec, Inc. Fluid treating apparatus. 4,326,954, Cl. 210-222.000.
Siccardi, Alberto: *See—*
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Siegel, Hardo: *See—*
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Siemens Aktiengesellschaft: *See—*
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Lechner, Robert, 4,327,253, Cl. 179-18.0FG.
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Siemens-Allis, Inc.: *See—*
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Holt, Dewilton R., 4,327,383, Cl. 360-45.000.
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Siemers, Paul A.; and Solomon, Harvey D., to General Electric Company. Method for coating a metal substrate. 4,327,120, Cl. 427-34.000.
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Sign Electronics Limited: *See—*
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Siiberg, Hemming G., to McGraw-Edison Company. Rechargeable flashlight with integral variable rate battery charger for automotive use. 4,327,401, Cl. 362-183.000.
Silbernagel, Raymond A.; and Sjolander, Garry L., to Minnesota Mining and Manufacturing Company. Wire cutting electrical connector. 4,326,767, Cl. 339-98.000.
Silver, Louis. Hygienic device providing sitz bath, shower, and douche. 4,326,308, Cl. 4-420.300.
Silvey, Elmer R. In-ground, insulated swimming pool construction and method. 4,326,364, Cl. 52-169.700.
Simmons Fastener Corporation: *See—*
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Simon, Jacques: *See—*
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Simone, Andre A.: *See—*
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Simpson, James H.: *See—*
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Singer Company, The: *See—*
Edson, Alvin W.; and Windyka, Richard A., 4,327,371, Cl. 358-10.000.
Greenwood, Ivan A.; and Simpson, James H., 4,327,327, Cl. 324-304.000.
Zylbert, Thaddeus J., 4,326,474, Cl. 112-184.000.
Sittler, Werner G. Apparatus for and method of collecting sawdust particles. 4,326,864, Cl. 55-364.000.
Sjolander, Garry L.: *See—*
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Skinner, Dean W.: *See—*
Schaffer, Robert R.; and Skinner, Dean W., 4,326,814, Cl. 400-125.100.
Skrobisch, Alfred, to Staver Company, Inc., The. Magnetic indicator assembly. 4,327,357, Cl. 340-373.000.
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Slaugh, Lynn H.; and Hoxmeier, Ronald J., to Shell Oil Company. Process for preparing a supported molybdenum carbide composition. 4,326,992, Cl. 252-443.000.
Slavik, Raymond F., to Minnesota Diversified Products, Inc. Method and apparatus for forming a permeable insulation board for building construction. 4,326,909, Cl. 156-253.000.
Sloboda, James J.: *See—*
Fomenko, Joseph; Kuecken, John A.; and Sloboda, James J., 4,327,251, Cl. 179-1.0SM.
Smith, David G., to Q-dot Corporation. Laundry drying system and method. 4,326,344, Cl. 34-54.000.
Smith, Edward H.; Dent, Thomas H.; and Marchese, Robert T., to Westinghouse Electric Corp. Decontamination apparatus. 4,326,317, Cl. 15-302.000.
Smith, Eugene D. Pressure tester for pipes. 4,326,406, Cl. 73-49.100.
Smith, Jack R.; and Reed, Terry J., to Westinghouse Electric Corp. Combined cycle electric power plant and a gas turbine having an improved overspeed protection system. 4,327,294, Cl. 290-40.00C.
Smith, Leslie H., to Imperial Chemical Industries Limited. Alkanolamine derivatives. 4,327,113, Cl. 424-321.000.
Smith, Paul, to Beecham Group Limited. 3-Nitro-1-phenyl-1-(m-chlorophenyl)-propan-2-ol. 4,327,228, Cl. 568-705.000.
Smith, Richard L.: *See—*
Miller, Robert N.; and Smith, Richard L., 4,327,152, Cl. 428-419.000.
Smith, Stanley B., Jr.; Schleicher, Robert G.; and Dennison, Allan G., to Instrumentation Laboratory Inc. Dual monochromator type of spectroanalysis system. 4,326,802, Cl. 356-316.000.
Smith, Thomas M. Gas-fired infra-red generators and use thereof. 4,326,843, Cl. 431-264.000.
Smith Valve Corporation: *See—*
Harding, Bruce L., 4,326,754, Cl. 303-81.000.
Smith, Willis M.: *See—*
Branovich, Louis E.; Daly, Edward; Newman, Albert F.; and Smith, Willis M., 4,327,131, Cl. 427-229.000.
SmithKline Corporation: *See—*
Holden, Kenneth G.; Kaiser, Carl; and Weinstock, Joseph, 4,327,023, Cl. 260-239.0BB.
Snamprogetti, S.p.A.: *See—*
Lagana, Vincenzo; and Zardi, Umberto, 4,327,068, Cl. 423-359.000.
SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Senni, Paolo; and Astarita, Domenico, 4,326,925, Cl. 203-37.000.
Snyder, William R.; and Feuerstein, Diane, to Betz Laboratories, Inc. Acrylic copolymer composition inhibits scale formation and disperses oil in aqueous systems. 4,326,980, Cl. 252-180.000.
Soar, Brian, to Parks-Cramer Company. Supply strand interruption mechanism for textile yarn spinning machine. 4,326,371, Cl. 57-87.000.
Sobotta, Peter: *See—*
Wirz, Arno; Sobotta, Peter; Arendt, Franz; and Gramlich, Otto K., 4,327,135, Cl. 428-600.000.
S.A. des Etablissements Staubli (France): *See—*
Palau, Joseph, 4,326,562, Cl. 139-68.000.
Societe Anonyme Francaise du Ferodo: *See—*
Billet, Rene, 4,326,611, Cl. 192-89.00B.
Dauvergne, Jean L. R., 4,326,379, Cl. 60-550.000.
Mouza, Jean-Claude, 4,326,610, Cl. 188-218.00A.
Societe d'Etude et de Construction de Machines pour Toutes Industries S.E.C.O.M.A., Societe Anonyme: *See—*
Perraud, Raymond, 4,326,449, Cl. 91-401.000.
Societe Nationale des Poudres et Explosifs: *See—*
Leneveu, Louis; and Treneules, Didier, 4,326,901, Cl. 149-12.000.
Solomon, Elias E. Ionization detector calibration. 4,327,289, Cl. 250-252.000.
Solomon, Harvey D.: *See—*
Siemers, Paul A.; and Solomon, Harvey D., 4,327,120, Cl. 427-34.000.
Solus Ocean Systems, Inc.: *See—*
Stefens, Walter L., 4,326,821, Cl. 405-171.000.
Sone, Takanori: *See—*
Murakami, Masahiro; Kobayashi, Masateru; Sone, Takanori; and Shibuya, Chisei, 4,327,211, Cl. 544-27.000.
Sony Corporation: *See—*
Tanaka, Masato, 4,327,382, Cl. 360-13.000.
Soriano G., Vicente; Marino A., Carmin; and Valdez, Enrique R., to Comision de Fomento Minero. Process for obtaining metal values from ores containing such metals as oxides or convertible into such oxides. 4,326,884, Cl. 75-71.000.
Sorm, Miloslav: *See—*
Novak, Jan; Sorm, Miloslav; Ulbert, Karel; Nespurek, Stanislav; Mikulcova, Dagmar; and Cmolik, Jiri, 4,326,966, Cl. 252-8.800.
Sotiropoulos, Peter. Vehicle lubrication system. 4,326,604, Cl. 184-7.00C.

Souillard, Michel, to Enertec. Protective apparatus for use with power lines. 4,327,392, Cl. 361-80.000.
Southern California Edison Company: *See—*
Welz, Ronald C., 4,327,324, Cl. 324-110.000.
Southern Research Institute: *See—*
Davis, Thomas A.; and Cowsar, Donald R., 4,327,046, Cl. 264-102.000.
Southland Manufacturing Co., Inc.: *See—*
Wintringham, Henry J., 4,327,144, Cl. 428-264.000.
Southware Company: *See—*
Arp, David F.; and Pariani, Ronald L., 4,326,700, Cl. 266-219.000.
Spatial Dynamics, Ltd.: *See—*
Yukl, Tex N., 4,327,322, Cl. 323-351.000.
Spazierer, Hubert: *See—*
Botz, Jakob; Feger, Rolf; Mutschler, Erich; Spazierer, Hubert; and Weber, Adam, 4,327,264, Cl. 200-295.000.
Spector, George: *See—*
Woychio, Stephen; and Spector, George, 4,326,731, Cl. 280-641.000.
Spectrospin AG: *See—*
Ernst, Richard R.; and Aue, Walter P., 4,327,425, Cl. 365-152.000.
Spencer, Homer K.; and Graben, Melvin M., to Sandoz, Inc. 1-Phenoxy-4-pyridylbutanes and derivatives. 4,326,879, Cl. 71-94.000.
Sperner, Franz, to W. C. Heraeus GmbH. Dental composition from gold particles, terpineol and ethyl cellulose. 4,326,889, Cl. 106-35.000.
Sperry Corporation: *See—*
Clark, Charles A., Jr., 4,327,405, Cl. 363-56.000.
Guenon, Jean-Pierre, 4,326,828, Cl. 414-39.000.
Reymersdal, Joseph V.; and Cooper, John H., 4,327,423, Cl. 365-8.000.
Sprangers, Ann M.: *See—*
Ryan, Lenore S.; Murray, Frank C.; Sprangers, Ann M.; Santoski, William J.; Sciaraffa, Michael A.; Abel, Kent W.; and Donnelly, Harold F., 4,326,528, Cl. 128-287.000.
Sprecher & Schuh AG: *See—*
Kull, Peter, 4,327,262, Cl. 200-148.00A.
Stafford, Richard W.: *See—*
Schuder, Maurice E.; and Stafford, Richard W., 4,327,259, Cl. 200-38.00A.
Stahl, Otto; and Schulz, Horst, to Georg Menshen & Co. KG; and Riedel-de Haen Aktiengesellschaft. Screw cap for bottle-type containers. 4,326,639, Cl. 215-252.000.
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Lillie, Christian, to Boehringer Ingelheim GmbH. 2-(Phenyl-amino)-2-imidazolines and salts. 4,327,106, Cl. 424-273.00R.
STAMAG Stadkauer Malzfabrik Aktiengesellschaft: *See—*
Weith, Alois, 4,327,116, Cl. 426-19.000.
Standard Change-Makers, Inc.: *See—*
Bayne, Robert T.; and Shireman, Phillip E., 4,326,643, Cl. 221-13.000.
Standard Oil Company, The: *See—*
Feldman, Daniel W., 4,327,002, Cl. 524-114.000.
Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,327,037, Cl. 260-465.300.
Standard Oil Company (Indiana): *See—*
Klotz, Marvin R., 4,327,236, Cl. 585-481.000.
Meyer, James S.; Robinson, Ken K.; Forgac, John M.; and Tatterson, David F., 4,326,944, Cl. 208-8.00R.
Wilder, Lawrence B., 4,326,586, Cl. 166-285.000.
Stauffer Chemical Company: *See—*
Gutman, Arnold D., 4,327,218, Cl. 546-291.000.
Stauffer, Robert. Massaging device. 4,326,508, Cl. 128-57.000.
Staupendahl, Gerhard: *See—*
Uerpmann, Ernst-Peter; Staupendahl, Gerhard; and Schmidt, Manfred, 4,326,820, Cl. 405-128.000.
Staver Company, Inc., The: *See—*
Skrobisch, Alfred, 4,327,357, Cl. 340-373.000.
Stearns, Charles F.; Chapski, David L.; and Vosseller, Kenneth F., to United Technologies Corporation. Governorless gas turbine fuel control. 4,326,376, Cl. 60-39.28R.
Steckler, Steven A.: *See—*
Balaban, Alvin R.; and Steckler, Steven A., 4,327,376, Cl. 358-159.000.
Steelyamamoto International Company Ltd.: *See—*
Sala, Franco, 4,326,609, Cl. 188-196.0BA.
Stefens, Walter L., to Solus Ocean Systems, Inc. Installing submerged pipeline. 4,326,821, Cl. 405-171.000.
Steffel, Charles R.; and Taylor, Bruce C., to Akron City Hospital. Circuit and method for the radiotelemetry of esophageal pH in an ECG radiotelemetry system. 4,326,535, Cl. 128-631.000.
Stein, Frederick, to Lichtman, Sandra. Portable door lock. 4,326,394, Cl. 70-14.000.
Steinbach, Robert L., to Chicago Lock Co. Plate tumbler for a cylinder lock mechanism. 4,326,396, Cl. 70-364.00R.
Steinhagen, Horst G.: *See—*
Black, James B.; Behlke, Darwin D.; and Steinhagen, Horst G., 4,326,433, Cl. 74-740.000.
Stephens, Stanley W., to Badalex Limited. Manufacture of electric light sources. 4,326,324, Cl. 29-25.190.
Stephenson, Earle W., to Kennametal Inc. Tool for earthworking machine. 4,326,592, Cl. 172-123.000.
Stephenson, Roger. Variable-speed transmission device with positive action. 4,326,431, Cl. 74-63.000.
Sterling Drug Inc.: *See—*
Archer, Sydney, 4,327,224, Cl. 560-142.000.
Bailey, Denis M., 4,327,022, Cl. 260-239.00B.
Stetter. Joseph R.; and Rutt, Donald R., to Becton, Dickinson and Company. Method and device for the detection and measurement of electrochemically active compounds. 4,326,927, Cl. 204-1.00T.
Stevens, Barry: *See—*
Nyman, Frederick R.; Stevens, Barry; and Calamari, James A., Jr., 4,327,048, Cl. 264-107.000.
Stevenson, Robert A.: *See—*
Crooks, Stephen J.; and Stevenson, Robert A., 4,327,256, Cl. 179-99.00R.
Stewart, David G.: *See—*
Ball, William J.; Cotton, Leonard; and Stewart, David G., 4,327,190, Cl. 518-714.000.
Stewart, Lindsay G.: *See—*
McAllister, John H.; Stewart, Lindsay G.; Gladysz, Carl V.; and Wilson, Jim, 4,326,887, Cl. 75-257.000.
Stohr, Gunter: *See—*
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Stokes, Anthony D. Gas recovery. 4,326,867, Cl. 62-10.000.
Stoll, Kurt. Band-feeding device. 4,326,658, Cl. 226-141.000.
Stone, H. Spencer. Visor-connected tape cartridge holder. 4,326,653, Cl. 224-312.000.
Stott, Paul E.: *See—*
West, Robert W.; Stott, Paul E.; and Ahnemiller, James, 4,327,196, Cl. 521-120.000.
Stover, William A.: *See—*
Chester, Arthur W.; and Stover, William A., 4,326,993, Cl. 252-455.00Z.
Stratton, Roy F.; and Calucci, Edward J., to United States of America, Air Force. Face plate for cathode ray tube. 4,327,306, Cl. 313-419.000.
Streb, Herbert R., to United States of America, Navy. High velocity exhaust diffuser and water baffle. 4,326,374, Cl. 60-39.09P.
Strecker, Dennis C. Hydraulic exerciser. 4,326,707, Cl. 272-130.000.
Strickler, John R.: *See—*
Chiu, Kuen-Wai; and Strickler, John R., 4,327,071, Cl. 423-646.000.
Strugala, Alfred; Schilling, Robert; and Adamaszek, Dieter, to Thyssen Industrie AG. Multiple mandrel-ring rolling machine. 4,326,397, Cl. 72-110.000.
Strupczewski, Joseph T.: *See—*
Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth A., 4,327,103, Cl. 424-267.000.
Stucki, Samuel: *See—*
Banziger, Robert; Isenschmid, Roland; Menth, Anton; Muller, Rene; and Stucki, Samuel, 4,326,943, Cl. 204-290.00F.
Nagel, Hartmut; and Stucki, Samuel, 4,326,930, Cl. 204-20.000.
Student, Joseph J., deceased: *See—*
Gregory, Floyd A.; Manning, Donald F.; Oranchak, William; and Student, Joseph J., deceased, 4,326,656, Cl. 226-59.000.
Student, Sophie A., administratrix: *See—*
Gregory, Floyd A.; Manning, Donald F.; Oranchak, William; and Student, Joseph J., deceased, 4,326,656, Cl. 226-59.000.
Stupak, Elliot: *See—*
Rosenkrantz, Bernard E.; and Stupak, Elliot, 4,327,087, Cl. 424-180.000.
Suarato, Antonino: *See—*
Bernardi, Luigi; Masi, Paolo; Suarato, Antonino; and Arcamone, Federico, 4,327,029, Cl. 260-351.100.
Sugai, Hiroshi; and Nakayama, Shoji, to Kabushiki Kaisha Morita Seisakusho. Dental handpiece. 4,326,846, Cl. 433-132.000.
Sugawara, Norio: *See—*
Nawa, Motoyuki; Sugawara, Norio; and Takahashi, Yutaka, 4,326,452, Cl. 98-40.0VT.
Sugaya, Takao: *See—*
Yamashita, Chikao; Sugaya, Takao; and Yoshida, Noriyuki, 4,326,472, Cl. 112-158.00D.
Sugimoto, Hiroaki: *See—*
Kato, Yasuyuki; Suzuki, Haruo; Kondo, Masatsune; Sugimoto, Hiroaki; Kimura, Junichi; and Saito, Zyunso, 4,327,205, Cl. 528-128.000.
Sugitani, Toshio: *See—*
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Sugiura, Hideaki: *See—*
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Sugiura, Yoji: *See—*
Uchiyama, Takashi; Suzuki, Ryoichi; Saito, Syuichiro; and Sugiura, Yoji, 4,326,786, Cl. 354-234.000.
Sugiyama, Yoshiki: *See—*
Kato, Kunio; Sugiyama, Yoshiki; and Enomoto, Ryo, 4,327,067, Cl. 423-345.000.
Suhara, Manabu; and Arai, Kiyotaka, to Asahi Glass Company, Ltd. Solution of fluorinated polymer having carboxylic acid salt groups. 4,327,010, Cl. 524-388.000.
Suhara, Yasuji: *See—*
Shinma, Nobuo; Umeda, Isao; Ishitsuka, Hideo; and Suhara, Yasuji, 4,327,088, Cl. 424-180.000.
Sullivan, Robert J.: *See—*
Neumeier, Karl E.; and Sullivan, Robert J., 4,326,937, Cl. 204-198.000.
Sulzer Brothers Limited: *See—*
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Sumitomo Chemical Company, Limited: *See—*
Kato, Yasuyuki; Suzuki, Haruo; Kondo, Masatsune; Sugimoto, Hiroaki; Kimura, Junichi; and Saito, Zyunso, 4,327,205, Cl. 528-128.000.

Mizutani, Masato; Tsushima, Kazunori; Sanemitsu, Yuzuru; and Hirano, Masachika, 4,327,094, Cl. 424-249.000.
Mizutani, Toshio; Itaya, Nobushige; Ohno, Nobuo; Matsuo, Takashi; Kitamura, Shigeyoshi; and Okuno, Yositosi, 4,327,109, Cl. 424-275.000.
Suzuki, Yukio, 4,327,038, Cl. 260-501.160.
Sumitomo Electric Industries, Ltd.: *See*—
Kamijo, Eiji; Murakami, Kazuhito; and Tani, Katsuto, 4,326,931, Cl. 204-22.000.
Kurosaki, Shiro; Watanabe, Minoru; and Usui, Yuichi, 4,326,869, Cl. 65-3.140.
Saito, Yasunori, 4,327,242, Cl. 174-11.00R.
Sumitomo Metal Industries Ltd.: *See*—
Chikata, Tsukasa; Sunami, Yoshihiko; Sasaki, Keiichi; and Nishioka, Kunihiko, 4,326,946, Cl. 208-93.000.
Summo, Arthur M., to Branson Ultrasonics Corporation. Method for securing parts together by ultrasonic energy. 4,326,903, Cl. 156-73.100.
Sunami, Yoshihiko: *See*—
Chikata, Tsukasa; Sunami, Yoshihiko; Sasaki, Keiichi; and Nishioka, Kunihiko, 4,326,946, Cl. 208-93.000.
Sundeen, Joseph E.; and Dejneka, Tamara, to E. R. Squibb & Sons, Inc. N-Substituted mercaptoacyl pripionamides. 4,327,111, Cl. 424-278.000.
Sunsetl, Ltd.: *See*—
Guibert, Raul, 4,327,279, Cl. 219-400.000.
Suntech, Inc.: *See*—
Davis, Brian C.; and Bryer, Robert P., 4,327,021, Cl. 524-297.000.
Suresh, Dev D.: *See*—
Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,327,037, Cl. 260-465.300.
Surkamp, Paul: *See*—
Brock, Josef; and Surkamp, Paul, 4,326,563, Cl. 139-76.000.
Sussman, Milton H.: *See*—
Rybicki, Edward B.; and Sussman, Milton H., 4,326,779, Cl. 350-414.000.
Suszylo, Jacky, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Keypad caller for a telephone set. 4,327,255, Cl. 179-90.00K.
Suzuki, Haruo: *See*—
Kato, Yasuyuki; Suzuki, Haruo; Kondo, Masatsune; Sugimoto, Hiroaki; Kimura, Junichi; and Saito, Zyunso, 4,327,205, Cl. 528-128.000.
Suzuki, Hideo, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instruments with tone color selection. 4,326,442, Cl. 84-1.190.
Suzuki, Hiroaki; and Kurihara, Michio, to Tokyo Shibaura Denki Kabushiki Kaisha. Constant current circuit. 4,327,321, Cl. 323-315.000.
Suzuki, Koji: *See*—
Tajima, Hatsuo; Iwami, Naoki; Masuda, Shunichi; Shimizu, Katsuichi; Kawatsura, Yoshihiro; Suzuki, Koji; and Yokomizo, Yoshikazu, 4,326,795, Cl. 355-14.00E.
Suzuki, Makoto: *See*—
Katoh, Tsuneyuki; Hiraga, Keishiro; Seki, Junji; and Suzuki, Makoto, 4,327,149, Cl. 428-332.000.
Suzuki, Nagatoshi. Air cleaner for engines, having back flow gas shut-off function. 4,326,862, Cl. 55-127.000.
Suzuki, Ryoichi: *See*—
Uchiyama, Takashi; Suzuki, Ryoichi; Saito, Syuichiro; and Sugiura, Yoji, 4,326,786, Cl. 354-234.000.
Suzuki, Toshio: *See*—
Hosokawa, Yasuhiko; Katsuki, Kanji; and Suzuki, Toshio, 4,327,314, Cl. 318-722.000.
Suzuki, Toshitatsu, to Ricoh, Co., Ltd. Focusing detection device. 4,327,284, Cl. 250-204.000.
Suzuki, Yukio, to Sumitomo Chemical Company, Limited. Method for preparing optically active 2,2-dimethyl-3-(2,2-dichlorovinyl)cyclopropanecarboxylic acid. 4,327,038, Cl. 260-501.160.
Svensson, Gunnar, to AB Svenska Flaktfabriken. Joint system for walls, doors and the like. 4,326,365, Cl. 52-204.000.
Svensson, Leif O. G.: *See*—
von Dardel, Guy; Henning, Sten A.; and Svensson, Leif O. G., 4,327,065, Cl. 423-338.000.
Sverdrup & Parcel and Associates, Inc.: *See*—
Gundersen, Ray S.; Colledge, Ronald J.; Jenkins, Roy H.; and Crook, Michael, 4,326,425, Cl. 73-863.530.
Swanson, David; and Edgren, David, to ALZA Corporation. Osmotic device that improves delivery properties of agent in situ. 4,326,525, Cl. 128-260.000.
Swanson, Kris E.: *See*—
Frissell, John M.; and Swanson, Kris E., 4,327,408, Cl. 364-200.000.
Sweeney, William M., to Texaco Inc. Filter for an internal combustion engine having rejuvenation capabilities. 4,326,378, Cl. 60-311.000.
Swisher, Scott N.; and Furman, Edward L., to Motorola, Inc. Active power supply ripple filter. 4,327,319, Cl. 323-303.000.
Swiss Aluminium Ltd.: *See*—
Baur, Rudolf, 4,326,974, Cl. 252-49.500.
Horn, Werner; and Hennings, Jurgen, 4,326,895, Cl. 148-11.50A.
Schmidt-Hatting, Wolfgang, 4,326,939, Cl. 204-228.000.
Sze, Morgan C.; and Simone, Andre A., to Lummus Company, The. Coke production from liquid derived from sub-bituminous and/or lignitic coal. 4,326,853, Cl. 44-1.00F.
Szente, Andre': *See*—
Branca, Quirico; Fischli, Albert E.; and Szente, Andre', 4,327,026, Cl. 260-239.30D.
T & R Chemicals, Inc.: *See*—
Alvarez, Jose A. A., 4,327,083, Cl. 424-162.000.
Tabacchi, Frank E. Device and process for fruit tree insect control. 4,326,359, Cl. 47-58.000.
Tachibana, Akifumi: *See*—
Hotta, Mitsuhiko; Tachibana, Akifumi; and Shigihara, Takanori, 4,327,427, Cl. 367-118.000.
Tada, Takeo; Honda, Katsuji; and Hirata, Yoshifumi, to TDK Electronics Co., Ltd. Anisotropic polymeric magnet in the tubular form and process for producing the same. 4,327,346, Cl. 335-296.000.
Taiho Kogyo Co., Ltd.: *See*—
Nozue, Shigehiro; Fukuoka, Tatsuhiko; and Sugiura, Hideaki, 4,326,758, Cl. 308-170.000.
Tajima, Hatsuo; Iwami, Naoki; Masuda, Shunichi; Shimizu, Katsuichi; Kawatsura, Yoshihiro; Suzuki, Koji; and Yokomizo, Yoshikazu, to Canon Kabushiki Kaisha. Image forming process and apparatus therefor. 4,326,795, Cl. 355-14.00E.
Takagi, Hideo: *See*—
Ueda, Akiyoshi; Takagi, Hideo; and Ohkuma, Kazuhiko, 4,326,881, Cl. 71-95.000.
Takahashi, Katsutoshi: *See*—
Matsuda, Akira; Yoshioka, Osamu; Takahashi, Katsutoshi; Yoshida, Kooichi; and Ninomiya, Hiroshi, 4,327,081, Cl. 424-81.000.
Takahashi, Masao: *See*—
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Takahashi, Yasuhiro, to Ricoh Company, Ltd. Original sheet circulation apparatus of copying machine. 4,326,705, Cl. 271-9.000.
Takahashi, Yutaka: *See*—
Nawa, Motoyuki; Sugawara, Norio; and Takahashi, Yutaka, 4,326,452, Cl. 98-40.0VT.
Takamatsu, Toshiaki: *See*—
Minezaki, Shigehiro; Takamatsu, Toshiaki; and Kozaki, Shuichi, 4,326,929, Cl. 204-15.000.
Takano, Shuntaro: *See*—
Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,327,097, Cl. 424-250.000.
Takase, Tsutomu: *See*—
Masuda, Takayoshi; Honjo, Masaru; Takase, Tsutomu; and Watanabe, Yoshimoto, 4,327,183, Cl. 435-274.000.
Takashima, Okuta: *See*—
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Takeda Chemical Industries, Ltd.: *See*—
Iwamoto, Seigo; and Saito, Eiichi, 4,327,017, Cl. 260-105.000.
Takeshita, Mikio; and Tashiro, Hiroyuki, to Nippondenso Co., Ltd. Liquid-level gauge for vehicles. 4,326,413, Cl. 73-313.000.
Takken, Edward H., to United States of America, Navy. Phase-slipped time delay and integration scanning system. 4,327,377, Cl. 358-199.000.
Tamura, Kazutaka. Weeding tool. 4,326,743, Cl. 294-55.500.
Tamura, Yasushi, to Sankyo Electric Company Limited. Temperature control circuit for automobile air-conditioning system. 4,326,386, Cl. 62-150.000.
Tamura, Zensuke: *See*—
Fujiwara, Kiyoshi; Nagatomo, Katsuaki; Yoshinaga, Shoji; Tamura, Zensuke; Shibata, Fumio; and Kanekiyo, Hiroshi, 4,326,666, Cl. 233-15.000.
Tanabe, Osamu, to Dainippon Screen Manufacturing Co., Ltd. Method of producing printed circuit boards. 4,327,167, Cl. 430-31.000.
Tanabe Seikaku Co., Ltd.: *See*—
Mushika, Yoshitaka; Tani, Junichi; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,327,101, Cl. 424-258.000.
Tanaka, Haruyuki: *See*—
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Tanaka, Hideki: *See*—
Sato, Eiji; Arai, Nobukatsu; Tanaka, Hideki; Fukushima, Toshihiko; and Nakajima, Tadakatsu, 4,326,391, Cl. 62-402.000.
Tanaka, Hiroshi: *See*—
Matsui, Hisanori; Tanaka, Hiroshi; Yabutani, Kunihiro; and Kurono, Hitoshi, 4,327,223, Cl. 549-39.000.
Tanaka, Kenichi, to Kakuichi Company Ltd. Process for manufacturing synthetic resin hose having a reinforcing member embedded therein and apparatus thereof. 4,326,905, Cl. 156-149.000.
Tanaka, Mamoru: *See*—
Fujikubo, Yoshitake; and Tanaka, Mamoru, 4,327,316, Cl. 320-2.000.
Tanaka, Masafumi, to Hitachi Denshi Kabushiki Kaisha. Frequency converter. 4,327,445, Cl. 455-118.000.
Tanaka, Masato, to Sony Corporation. Method and apparatus for editing digital signals recorded on a record medium. 4,327,382, Cl. 360-13.000.
Tanaka, Satoru; Shimada, Katsutoshi; Hashimoto, Kazunori; Ema, Kiichi; and Ueda, Koichiro, to Eisai Co., Ltd. Cyanoguanidine derivatives. 4,327,217, Cl. 546-281.000.
Tanaka, Takanori; and Morishita, Masanobu, to Nippon Electric Co., Ltd. Automatic iris control for solid-stage imaging apparatus. 4,327,378, Cl. 358-228.000.
Tanaka, Yoshikatu: *See*—
Mituhashi, Kazuyuki; Matumoto, Kunio; Shirai, Haruo; and Tanaka, Yoshikatu, 4,327,247, Cl. 174-68.500.

Tandy Corporation: *See*—
Kumazaki, Katsuaki, 4,327,254, Cl. 179-84.00T.
Tang, Phillip H., to Amtel, Inc. Single leg mooring terminal. 4,326,312, Cl. 441-5.000.
Tani, Junichi: *See*—
Mushika, Yoshitaka; Tani, Junichi; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,327,101, Cl. 424-258.000.
Tani, Katsuto: *See*—
Kamijo, Eiji; Murakami, Kazuhito; and Tani, Katsuto, 4,326,931, Cl. 204-22.000.
Tanigawa, Nobuyoshi: *See*—
Fujimura, Kensuke; Yamamoto, Naomichi; Ogawa, Masahiro; and Tanigawa, Nobuyoshi, 4,327,059, Cl. 422-259.000.
Tanner, John D. Synthetic firelog. 4,326,854, Cl. 44-10.00B.
Tashiro, Hiroyuki: *See*—
Takeshita, Mikio; and Tashiro, Hiroyuki, 4,326,413, Cl. 73-313.000.
Tatch, Fred G. Fairing for ground-travelling vehicle. 4,326,728, Cl. 280-289.00S.
Tate, Benjamin. Bottle carrier. 4,326,629, Cl. 206-203.000.
Tatterson, David F.: *See*—
Meyer, James S.; Robinson, Ken K.; Forgac, John M.; and Tatterson, David F., 4,326,944, Cl. 208-8.00R.
Taumann, Leonhard, to Siemens Medical Laboratories, Inc. Electron accelerator and target with collimator. 4,327,293, Cl. 250-505.000.
Taylor, Bruce C.: *See*—
Steffel, Charles R.; and Taylor, Bruce C., 4,326,535, Cl. 128-631.000.
TDK Electronics Co., Ltd.: *See*—
Hirayama, Hiromitsu, 4,327,348, Cl. 336-184.000.
Tada, Takeo; Honda, Katsuji; and Hirata, Yoshifumi, 4,327,346, Cl. 335-296.000.
Technology Glass Corporation: *See*—
Miltenberger, Charles W.; Lucas, Edward J.; and Schreier, Ulrich, 4,326,872, Cl. 65-112.000.
Tecumseh Products Company: *See*—
Fry, Emanuel D.; and Siewert, Herbert G., 4,326,839, Cl. 417-295.000.
Teixeira, Manuel G.; and Valois, Rene J., to Lessona Corporation. Loom stop motion system and method. 4,326,564, Cl. 139-370.200.
Temple, Victor A. K., to Electric Power Research Institute, Inc. Thyristor with even turn-on line potential and method with 1-micron to 5-mil wide alignment region band. 4,327,367, Cl. 357-38.000.
Terada, Jiro; and Nitta, Tsuneharu, to Matsushita Electric Industrial Co., Ltd. Humidity detecting apparatus. 4,326,414, Cl. 73-336.500.
Tetro, Richard S.; and Harmon, Paul E., to Black Clawson Company, The. Web cutter for a surface winder. 4,326,680, Cl. 242-56.00A.
Tetro, Richard S.: *See*—
Phelps, Richard W.; and Tetro, Richard S., 4,326,679, Cl. 242-56.00A.
Teuber, Michael: *See*—
Moebus, Otto; Teuber, Michael; and Kiesbye, Peter, 4,327,179, Cl. 435-42.000.
Texaco Development Corporation: *See*—
Burns, Robert B., 4,326,595, Cl. 175-9.000.
Hunter, Walter D., 4,326,969, Cl. 252-8.55D.
Muenger, James R.; Child, Edward T.; and Brent, Albert, 4,326,856, Cl. 48-197.00R.
Texaco Inc.: *See*—
Donner, Gary L., 4,326,806, Cl. 356-410.000.
Hammond, Kenneth G.; and Chafetz, Harry, 4,326,973, Cl. 252-34.000.
Sweeney, William M., 4,326,378, Cl. 60-311.000.
Zang, Hyung K., 4,326,948, Cl. 208-177.000.
Texas Instruments Incorporated: *See*—
Bradshaw, David H., 4,327,441, Cl. 375-113.000.
Chapman, Richard A.; Kinch, Michael A.; and Hynecek, Jaroslav, 4,327,291, Cl. 250-332.000.
Guterman, Daniel C., 4,326,331, Cl. 29-571.000.
McAdams, Hugh P., 4,327,426, Cl. 365-203.000.
McElroy, David J., 4,326,329, Cl. 29-571.000.
Th. Goldschmidt AG: *See*—
Fink, Hans-Ferdi; and Freiberger, Rolf, 4,326,999, Cl. 524-261.000.
Thene, Anthony A. Aggregate distributor. 4,326,673, Cl. 239-657.000.
Thermatool Corporation: *See*—
Rudd, Wallace C., 4,326,583, Cl. 165-183.000.
Thermowag AG: *See*—
Werner, Beat, 4,326,366, Cl. 52-220.000.
Thoma, Andreas, to Apparatebau Gauting GmbH. Method and apparatus for measuring the risk of ice formation. 4,327,286, Cl. 250-231.00R.
Thomas, Dale C.: *See*—
Lavery, Lawrence P.; Wilcox, David G.; and Thomas, Dale C., 4,326,646, Cl. 222-56.000.
Thompson, Kenneth P.; and Ihde, Richard C., to Champion International Corporation. Polymeric multi-layer sheet material and tray. 4,327,136, Cl. 428-35.000.
Thompson, Phillip B.; and Roberts, Hill W., to McDonnell Douglas Corporation. Speaker bezel/retainer. 4,326,599, Cl. 181-175.000.
Thomson-CSF: *See*—
Becavin, Henri; Bailly, Alain; and Lemerle, Philippe, 4,327,334, Cl. 333-1.000.
Bert, Alain, 4,327,339, Cl. 331-107.00P.
Hartemann, Pierre, 4,326,423, Cl. 73-861.630.
Henry, Raymond; Bouvet, Jean-Victor; Chapard, Alain; and Simon, Jacques, 4,326,771, Cl. 350-96.170.
LePage, Joel; Laviron, Michel; and Derewonko, Henri, 4,326,330, Cl. 29-571.000.
Micheron, Francois, 4,327,153, Cl. 428-421.000.
Thomson, John G., to Gall Thomson Maritime Limited. Breakaway coupling. 4,326,555, Cl. 137-68.00R.
Thorud, Richard A., to Toro Company, The. Rotary lawn mower. 4,326,370, Cl. 56-202.000.
Thurlow, John F., to Dennison Manufacturing Company. Transfer coating methods, compositions and products. 4,327,128, Cl. 427-153.000.
Thyssen Industrie AG: *See*—
Strugala, Alfred; Schilling, Robert; and Adamaszek, Dieter, 4,326,397, Cl. 72-110.000.
Tillinghast, John A., to Wheelabrator-Frye, Inc. Capillary processing unit. 4,327,058, Cl. 422-232.000.
Timmler, Helmut; Buchel, Karl; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, to Bayer Aktiengesellschaft. 1-Phenyl-2-(1,2,4-triazolyl-1-yl)-ethyl ether. 4,327,104, Cl. 424-269.000.
Timmons, John P., to Schlumberger Limited. Well logging data processing technique. 4,327,412, Cl. 364-422.000.
Tintignac, Jean P.: *See*—
Georgen, Daniel; and Tintignac, Jean P., 4,327,118, Cl. 426-656.000.
TMX Systems Limited: *See*—
Court, Patrick R. J., 4,327,444, Cl. 455-100.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Okumura, Yoshiharu; Furukawa, Hiroshi; and Kaneko, Katsumi, 4,327,231, Cl. 568-899.000.
Toda, Yuzo; Kobayashi, Hidetoshi; and Koizumi, Junji, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,327,175, Cl. 430-546.000.
Toki, Tadaaki: *See*—
Haga, Takahiro; Toki, Tadaaki; Koyanagi, Toru; and Imai, Osamu, 4,327,089, Cl. 424-200.000.
Tokunaga, Kaoru: *See*—
Ohara, Susumu; Horiki, Akira; Miyazaki, Katsuyuki; and Tokunaga, Kaoru, 4,327,436, Cl. 370-110.100.
Tokyo Eizai Laboratory Co. Ltd.: *See*—
Usukura, Koji, 4,326,509, Cl. 128-90.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Asaba, Shuuji; Nemoto, Minoru; Ushimi, Kenji; and Ono, Akira, 4,327,275, Cl. 219-121.0LD.
Ikeda, Takashi; and Ayano, Shinya, 4,326,832, Cl. 415-219.00R.
Komatsu, Michiyasu; Tsuge, Akihiko; Komeya, Katsutoshi; and Ando, Akio, 4,327,187, Cl. 501-97.000.
Nishimura, Fuminobu, 4,326,794, Cl. 355-3.00R.
Ozu, Masao; Morita, Keiichi; and Itoh, Hiroshi, 4,326,868, Cl. 62-324.600.
Saito, Tutomu; and Yamaguchi, Ryoji, 4,327,287, Cl. 250-234.000.
Seimiya, Motoo, 4,327,066, Cl. 423-345.000.
Suzuki, Hiroaki; and Kurihara, Michio, 4,327,321, Cl. 323-315.000.
Uchida, Yukimasa, 4,327,368, Cl. 357-42.000.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Gomi, Hiroshi, 4,327,373, Cl. 358-28.000.
Kigawa, Teruo, 4,326,473, Cl. 112-158.00E.
Tomaro, John W., to Conair Corporation. Simplified multiple speed hair dryer. 4,327,278, Cl. 219-364.000.
Tomatis, Alfred A. A. A. Apparatus for conditioning hearing. 4,327,252, Cl. 179-1.00N.
Tomeczek, Kazimiera D.: *See*—
Levine, Aaron W.; Tomeczek, Kazimiera D.; and Harper, Stanley A., 4,327,123, Cl. 427-64.000.
Tomen, Dan. Quick transfer tow bar. 4,326,730, Cl. 280-502.000.
Tomimoto, Tetsuo: *See*—
Matsuda, Yoshiteru; Tomimoto, Tetsuo; and Nagaoka, Yoshitomo, 4,327,374, Cl. 358-28.000.
Tomino, Naoki: *See*—
Tsukamoto, Masaaki; Ohkubo, Yuji; and Tomino, Naoki, 4,326,785, Cl. 354-60.00F.
Tomita, Masao; Isaka, Takenobu; Mino, Mineo; and Fujisawa, Kiyoji, to Matsushita Electric Industrial Co., Ltd. Rotary head type magnetic tape recording reproducing apparatus. 4,327,384, Cl. 360-77.000.
Toms, Maxwell H., to Commonwealth of Australia. Time delay device. 4,326,461, Cl. 102-277.000.
Tomy Kogyo Co., Inc.: *See*—
Minami, Koichi; and Watanabe, Hiroyuki, 4,326,721, Cl. 273-315.000.
Watanabe, Saburo, 4,326,355, Cl. 46-44.000.
Tong, S. N.: *See*—
Hao, Paul L. C.; Hsu, W. W.; Lin, W. S.; Tong, S. N.; Hung, H. K.; and Chang, M. C., 4,327,003, Cl. 523-336.000.
Toro Company, The: *See*—
Thorud, Richard A., 4,326,370, Cl. 56-202.000.
Toyama Chemical Co., Ltd.: *See*—
Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,327,097, Cl. 424-250.000.
Toyama, Kohji; Fuchigami, Mitsuru; Nagayasu, Isao; and Tsukahara, Hirokazu, to Mitsubishi Paper Mills, Ltd. Self-contained color forming pressure sensitive record paper of the single coating type. 4,327,148, Cl. 428-320.800.
Toyama, Masamichi: *See*—
Hirata, Noritsugu; Toyama, Masamichi; Okajima, Hidekazu; and Nishimura, Akimasa, 4,326,790, Cl. 354-288.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Chuwman, Tsutomu, 4,326,607, Cl. 188-79.50S.
Morisawa, Kunio, 4,326,816, Cl. 403-228.000.

Tozawa, Yukio: *See*—
Mizumoto, Yasuhiro; Tozawa, Yukio; Kozima, Masatoshi; and Hirai, Masaru, 4,326,576, Cl. 152-356.00R.

Tran, Luan G.; Effler, Timothy A.; and Wat, Karen K., to Mattel, Inc. Electronic maze game. 4,326,719, Cl. 273-238.000.

Transtech International Corporation: *See*—
Wang, Gary Y., 4,327,421, Cl. 364-900.000.

Trautmann, Harry J.: *See*—
Pilesi, William D.; and Trautmann, Harry J., 4,326,421, Cl. 73-852.000.

Treneules, Didier: *See*—
Leneveu, Louis; and Treneules, Didier, 4,326,901, Cl. 149-12.000.

Tresper, Erhard: *See*—
Lehr, Gunter; Hucks, Uwe; Vernaleken, Hugo; Nielinger, Werner; and Tresper, Erhard, 4,327,208, Cl. 528-323.000.

TRW Inc.: *See*—
Meyers, Robert A., 4,327,070, Cl. 423-555.000.

Tse, Brian H. Vertically positioning window shading system. 4,326,577, Cl. 160-259.000.

Tsuboi, Takashi; Okamatsu, Shigetoshi; Ibamoto, Masahiko; Narita, Hiroshi; and Kozu, Eiji, to Hitachi, Ltd. Control apparatus for electric car. 4,327,313, Cl. 318-52.000.

Tsuchida, Tsuyoshi: *See*—
Akimoto, Keiichi; and Tsuchida, Tsuyoshi, 4,326,337, Cl. 33-174.0PA.

Tsuge, Akihiko: *See*—
Komatsu, Michiyasu; Tsuge, Akihiko; Komeya, Katsutoshi; and Ando, Akio, 4,327,187, Cl. 501-97.000.

Tsukahara, Hirokazu: *See*—
Toyama, Kohji; Fuchigami, Mitsuru; Nagayasu, Isao; and Tsukahara, Hirokazu, 4,327,148, Cl. 428-320.800.

Tsukamoto, Masaaki; Ohkubo, Yuji; and Tomino, Naoki, to Nippon Kogaku K.K. Camera having a connector common to a flash bulb unit and an electronic flash unit. 4,326,785, Cl. 354-60.00F.

Tsushima, Kazunori: *See*—
Mizutani, Masato; Tsushima, Kazunori; Sanemitsu, Yuzuru; and Hirano, Masachika, 4,327,094, Cl. 424-249.000.

Tsutsui, Kyoji: *See*—
Sasaki, Masaomi; Ohta, Masafumi; and Tsutsui, Kyoji, 4,327,020, Cl. 260-160.000.

Tucker, Trevor W.: *See*—
Cornish, William D.; and Tucker, Trevor W., 4,327,336, Cl. 331-8.000.

Tufts, Robert A.: *See*—
Schillerstrom, Merl S.; and Tufts, Robert A., 4,326,369, Cl. 56-41.000.

Tuller, Harold W.: *See*—
Vanderkooi, Nicholas, Jr.; and Tuller, Harold W., 4,327,007, Cl. 524-315.000.

Turley, Patricia A.: *See*—
Capuano, Italo A.; Turley, Patricia A.; and DuBord, Edward W., 4,326,850, Cl. 23-230.00R.

Turner, Gary A., to Bell Telephone Laboratories, Incorporated. High capacity elastic store having continuously variable delay. 4,327,411, Cl. 364-900.000.

Twin Disc, Incorporated: *See*—
Black, James B.; Behlke, Darwin D.; and Steinhagen, Horst G., 4,326,433, Cl. 74-740.000.

Tyler Refrigeration Corporation: *See*—
Ibrahim, Fayez F., 4,326,385, Cl. 62-82.000.

UBE Industries Ltd.: *See*—
Fujimura, Kensuke; Yamamoto, Naomichi; Ogawa, Masahiro; and Tanigawa, Nobuyoshi, 4,327,059, Cl. 422-259.000.
Iwai, Tadashi; Mizuno, Hisayuki; and Miura, Masao, 4,327,062, Cl. 423-292.000.

Uchida, Yukimasa, to Tokyo Shibaura Denki Kabushiki Kaisha. CMOS Transistor pair with reverse biased substrate to prevent latch-up. 4,327,368, Cl. 357-42.000.

Uchiyama, Takashi; Suzuki, Ryoichi; Saito, Syuichiro; and Sugiura, Yoji, to Canon Kabushiki Kaisha. Electromagnetically driven shutter. 4,326,786, Cl. 354-234.000.

Ueberschaer, Hubert J., to Mobil Oil Corporation. Liquid sampling gauge apparatus. 4,326,427, Cl. 73-864.650.

Ueda, Akiyoshi; Takagi, Hideo; and Ohkuma, Kazuhiko, to Nippon Soda Company Limited. Phenylpyrol derivatives. 4,326,881, Cl. 71-95.000.

Ueda, Hiroshi: *See*—
Kawamura, Kunio; and Ueda, Hiroshi, 4,326,783, Cl. 354-25.000.

Ueda, Ikuo; Kobayashi, Masakazu; Yamada, Hisashi; and Ono, Hiroki, to Fujisawa Pharmaceutical Co., Ltd. 3,7-Disubstituted-2 or 3-cephem-4-carboxylic acid compounds. 4,327,093, Cl. 424-246.000.

Ueda, Koichiro: *See*—
Tanaka, Satoru; Shimada, Katsutoshi; Hashimoto, Kazunori; Ema, Kiichi; and Ueda, Koichiro, 4,327,217, Cl. 546-281.000.

Uehara, Tsutomu: *See*—
Sawa, Yuji; Endo, Shigeru; and Uehara, Tsutomu, 4,327,137, Cl. 428-35.000.

Ueno, Ichiro: *See*—
Wada, Yoshiyo; Kinjo, Hisao; and Ueno, Ichiro, 4,327,430, Cl. 369-43.000.

Uerpmann, Ernst-Peter; Staupendahl, Gerhard; and Schmidt, Manfred, to Gesellschaft fur Strahlen-und Umweltforschung mbH Munchen. Final depository for radioactive wastes. 4,326,820, Cl. 405-128.000.

Ulbert, Karel: *See*—
Novak, Jan; Sorm, Miloslav; Ulbert, Karel; Nespurek, Stanislav; Mikulcova, Dagmar; and Cmolik, Jiri, 4,326,966, Cl. 252-8.800.

Umeda, Isao: *See*—
Shinma, Nobuo; Umeda, Isao; Ishitsuka, Hideo; and Suhara, Yasuji, 4,327,088, Cl. 424-180.000.

Underkoffler, Edwin C.: *See*—
Gdula, Michael; Hodsoll, Raymond J.; and Underkoffler, Edwin C., 4,327,420, Cl. 364-721.000.

Ungar, Israel S.: *See*—
Scher, Herbert I.; and Ungar, Israel S., 4,327,141, Cl. 428-148.000.

Union Carbide Corporation: *See*—
Colon, Ismael; Maresca, Louis M.; and Kwiatkowski, George T., 4,326,989, Cl. 252-429.00R.
D'Silva, Themistocles D. J., 4,327,110, Cl. 424-277.000.
Jones, Steven D.; and Blomgren, George E., 4,327,159, Cl. 429-101.000.
Jones, Steven D.; and Blomgren, George E., 4,327,160, Cl. 429-101.000.
Leger, Violeta Z., 4,327,166, Cl. 429-194.000.
McGill, William C., 4,326,361, Cl. 51-168.000.
Peters, Edward N., 4,327,013, Cl. 524-538.000.

Union Oil Company of California: *See*—
Young, Donald C., 4,326,875, Cl. 71-11.000.

Uniroyal, Inc.: *See*—
West, Robert W.; Stott, Paul E.; and Ahnemiller, James, 4,327,196, Cl. 521-120.000.

United Kingdom Atomic Energy Authority: *See*—
Bentley, Peter D.; and Pollock, James F., 4,327,271, Cl. 219-85.00E.

United States of America
Air Force: *See*—
Karas, Nicholas V., 4,327,358, Cl. 340-541.000.
Stratton, Roy F.; and Calucci, Edward J., 4,327,306, Cl. 313-419.000.

Army: *See*—
Arpin, John B.; and Di Vita, Sam, 4,326,657, Cl. 226-97.000.
Ashley, Albert H., 4,327,406, Cl. 363-56.000.
Berg, Norman J.; Casseday, Michael W.; Lee, John N.; and Abramovitz, Irwin J., 4,326,778, Cl. 350-358.000.
Berlin, Howard M., 4,327,361, Cl. 340-634.000
Branovich, Louis E.; Daly, Edward; Newman, Albert F.; and Smith, Willis M., 4,327,131, Cl. 427-229.000.
Burke, Leonard F.; and Dean, Arthur P., 4,326,463, Cl. 102-513.000.
Drzewiecki, Tadeusz M., 4,326,559, Cl. 137-804.000.
King, Paul V.; Becher, Albert F.; and Henderson, Wilmer P., 4,326,468, Cl. 109-49.500.
Magnuson, Roland A., 4,326,446, Cl. 89-38.000.
Price, Renata F., 4,326,464, Cl. 102-523.000.
Roberts, Thomas G., 4,327,338, Cl. 372-89.000.

Commerce: *See*—
Martinez, Richard I.; and Herron, John T., 4,327,233, Cl. 585-357.000.

Energy: *See*—
Berg, Lloyd; McCandless, Frank P.; and Ramer, Ronald J., 4,326,995, Cl. 252-465.000.
Doss, James D.; and Hutson, Richard L., 4,326,529, Cl. 128-303.100.
Henderson, Timothy M.; and Kool, Lawrence B., 4,327,192, Cl. 521-56.000.
Migliori, Albert, 4,326,417, Cl. 73-601.000.
Rapier, Pascal M., 4,326,581, Cl. 165-45.000.
Wilson, Dennis C. W., 4,326,741, Cl. 292-307.00R.

National Aeronautics and Space Administration; administrator; with respect to an invention of:
Gelderloos, Hendrik J. C. Reconfiguring redundancy management. 4,327,437, Cl. 371-68.000.

National Aeronautics and Space Administration: *See*—
Jensen, Ronald N., 4,326,381, Cl. 60-641.140.
Reed, Robert D., 4,326,685, Cl. 244-175.000.
White, William T.; Clemons, Johnny M.; and Ledbetter, Frank E., III, 4,327,150, Cl. 428-332.000.

Navy: *See*—
Himy, Albert; and Wagner, Otto C., 4,327,157, Cl. 429-61.000.
Streb, Herbert R., 4,326,374, Cl. 60-39.09P.
Takken, Edward H., 4,327,377, Cl. 358-199.000.

U.S. Philips Corporation: *See*—
De Ronde, Frans C., 4,327,342, Cl. 333-204.000.
Goddijn, Bernardus H. A., 4,327,299, Cl. 310-49.00R.
Persoon, Eric H. J., 4,327,354, Cl. 340-146.3MA.
Rademaker, Gerrit, 4,327,249, Cl. 178-3.000.
Van der Valk, Nicolaas J. L., 4,327,372, Cl. 358-14.000.

United States Steel Corporation: *See*—
Henricks, Arthur R., 4,326,899, Cl. 148-120.000.

United Technologies Corporation: *See*—
Fitton, David L., 4,326,836, Cl. 416-196.00R.
Stearns, Charles F.; Chapski, David L.; and Vosseller, Kenneth F., 4,326,376, Cl. 60-39.28R.

Universal Tipping Company Incorporated: *See*—
Barr, William H., 4,326,704, Cl. 270-58.000.

University of Akron, The: *See*—
Kennedy, Joseph P.; and Frisch, Kurt C., Jr., 4,327,201, Cl. 526-131.000.

University of Delaware: *See*—
Hicks, Douglas C.; and Pleass, Charles M., 4,326,840, Cl. 417-331.000.

University of Miami: *See*—
Ryan, James W.; and Chung, Alfred, 4,327,178, Cl. 435-23.000.
University of Utah: *See*—
Johnson, Steven A.; and Seader, Junior D., 4,327,184, Cl. 435-287.000.
UOP Inc.: *See*—
Antos, George J., 4,327,240, Cl. 585-744.000.
Flagg, John F.; Johnson, Russell W.; and Gatsis, John G., 4,326,945, Cl. 208-8.0LE.
Uotila, Jarmo I. Parachute with low opening shock and high stability. 4,326,683, Cl. 244-145.000.
Upper Lakes Shipping Ltd.: *See*—
Pole, Charles D., 4,326,476, Cl. 114-40.000.
Ushimi, Kenji: *See*—
Asaba, Shuuji; Nemoto, Minoru; Ushimi, Kenji; and Ono, Akira, 4,327,275, Cl. 219-121.0LD.
Usui, Yuichi: *See*—
Kurosaki, Shiro; Watanabe, Minoru; and Usui, Yuichi, 4,326,869, Cl. 65-3.140.
Usukura, Koji, to Tokyo Eizai Laboratory Co. Ltd. Thermoplastic composition for setting bandages and a solventless process for the manufacture thereof. 4,326,509, Cl. 128-90.000.
Vaillancourt, Vincent L., to Critikon, Inc. Stopcock seal. 4,326,569, Cl. 141-383.000.
Vaitekunas, Peter T.: *See*—
Eckles, William E.; Bishop, Craig V.; and Vaitekunas, Peter T., 4,326,940, Cl. 204-232.000.
Valdez, Enrique R.: *See*—
Soriano G., Vicente; Marino A., Carmin; and Valdez, Enrique R., 4,326,884, Cl. 75-71.000.
Vallourec: *See*—
Begue, Bernard, 4,326,398, Cl. 72-193.000.
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Kankaanpaa, Matti, 4,326,456, Cl. 100-41.000.
Valois, Rene J.: *See*—
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Vanderkooi, Nicholas, Jr.; and Tuller, Harold W., to Allied Chemical Corporation. Polyethylene terephthalate composition containing aliphatic plasticizer and nucleating agent. 4,327,007, Cl. 524-315.000.
Van der Valk, Nicolaas J. L., to U.S. Philips Corporation. Encoding circuit for a secam color television transmitter. 4,327,372, Cl. 358-14.000.
Van Manen, Dick T., to Voplex Corporation. Dispensing system using cartridge with interlocking plunger. 4,326,650, Cl. 222-386.000.
Van Meter, Geraldine S., executrix: *See*—
Van Meter, Homer, deceased; and Van Meter, Geraldine S., executrix, 4,326,407, Cl. 73-49.100.
Van Meter, Homer, deceased; and by Van Meter, Geraldine S., executrix. Leak test tools. 4,326,407, Cl. 73-49.100.
Van Mullekom, Hubert P. Apparatus for inserting successive weft yarn lengths in a shuttleless weaving machine. 4,326,565, Cl. 139-435.000.
Van Zijderveld, George J., to M.C.C. Nederland B.V. Sprocket-wheel gear-wheel or like wheel substantially manufactured from a synthetic material. 4,326,849, Cl. 474-161.000.
van Zorge, Jacob A., to ACF Chemiefarma VA. Alpha-hydrocarbonoxyimino-pyrazineacetonitriles. 4,327,213, Cl. 544-336.000.
Varta Batterie Aktiengesellschaft: *See*—
Borger, Waldemar, 4,327,162, Cl. 429-120.000.
Kuhl, Thomas, 4,327,165, Cl. 429-174.000.
Vayssie, Charles: *See*—
Bouillon, Claude; Vayssie, Charles; and Richard, Francoise, 4,327,031, Cl. 260-429.900.
VEB Kombinat Walzlager und Normteile: *See*—
Murzin, Horst; Woss, Rainer; Burghoff, Hans; Schmieder, Frank; Herzig, Alfred; Junge, Johannes; and Deckarm, Gunter, 4,326,625, Cl. 198-653.000.
Velarde, Ronald G.: *See*—
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Vercon Inc.: *See*—
Mistarz, Robert J., 4,326,567, Cl. 141-90.000.
Vernaleken, Hugo: *See*—
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Verplank, C. Michael. Tooth probe device. 4,326,547, Cl. 132-89.000.
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Howard, Kenneth J.; and Sidwell, Albert E., 4,327,027, Cl. 260-340.300.
Vianova Kunstharz, A.G.: *See*—
Leitner, Wolfgang; Pampouchidis, Georg; and Bleikolm, Anton, 4,327,200, Cl. 525-531.000.
Victor Company of Japan, Ltd.: *See*—
Kohda, Kazuo, 4,327,389, Cl. 360-105.000.
Wada, Yoshiyo; Kinjo, Hisao; and Ueno, Ichiro, 4,327,430, Cl. 369-43.000.
Vignaud, Jean-Claude; and Juery, Gerard, to La Telemecanique Electrique. Locking device for two push buttons. 4,327,260, Cl. 200-50.00C.
Vinals, Joaquin F.: *See*—
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,326,998, Cl. 252-522.00R.
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Vock, Manfred H.: *See*—
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Volgenau, Lewis: *See*—
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Volkland, Charles: *See*—
Zumbahlen, Louis H., Jr.; and Volkland, Charles, 4,327,258, Cl. 179-175.30R.
Volkmann, Josef F.; Hatter, Edwin E.; and Schuster, Michael M., to Hi Shear Corporation. Balanced pin for shear flow joint, and joint including the pin. 4,326,825, Cl. 411-5.000.
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Bernhardt, Winfried; Grundmann, Edgard; and Kroll, Rudolf, 4,326,500, Cl. 126-426.000.
Vollmecke, Hermann: *See*—
Carneim, Wilfried; Hillemanns, Herbert; Vollmecke, Hermann; Ribken, Hans; Schumacher, Heinz; and Roether, Kurt, 4,326,699, Cl. 266-114.000.
Volpe, Richard L., to White Consolidated Industries, Inc. Safety feed table release mechanism. 4,326,618, Cl. 193-17.000.
von Dardel, Guy; Henning, Sten A.; and Svensson, Leif O. G. Method of preparing silica aerogel. 4,327,065, Cl. 423-338.000.
von Meer, Walter, to Schoeller, Felix, Jr. Method of preparing a carrier material for photography. 4,327,174, Cl. 430-530.000.
von Recklinghausen, Daniel R., to Electro Audio Dynamics Inc. Dynamic speaker equalizer. 4,327,250, Cl. 179-1.00F.
Voorhees, John E., to Hobart Corporation. Heat recovery system for a dishwasher. 4,326,551, Cl. 134-58.00D.
Voplex Corporation: *See*—
Van Manen, Dick T., 4,326,650, Cl. 222-386.000.
Vosper Hovermarine Limited: *See*—
Carter, Rory A. C., 4,326,477, Cl. 114-67.00A.
Vosseller, Kenneth F.: *See*—
Stearns, Charles F.; Chapski, David L.; and Vosseller, Kenneth F., 4,326,376, Cl. 60-39.28R.
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W. C. Heraeus GmbH: *See*—
Sperner, Franz, 4,326,889, Cl. 106-35.000.
W. R. Grace & Co.: *See*—
Feinberg, Stewart C.; Lundsager, Christian B.; Lundquist, Joseph T., Jr.; and Balouskus, Robert A., 4,327,164, Cl. 429-144.000.
Waagner-Biro Aktiengesellschaft: *See*—
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Wacker-Chemie GmbH: *See*—
Kratel, Gunter; Dummer, Gerhard; Niessner, Peter; Grune, Burkhard; and Stohr, Gunter, 4,326,852, Cl. 23-293.00R.
Wada, Masami: *See*—
Kusumi, Hiroshi; and Wada, Masami, 4,326,736, Cl. 285-98.000.
Wada, Takeshi; and Okuni, Tetsuo, to Hitachi, Ltd. Method of fabricating a structural member by electro slag forming. 4,326,580, Cl. 164-497.000.
Wada, Yoshiyo; Kinjo, Hisao; and Ueno, Ichiro, to Victor Company of Japan, Ltd. Information signal recording medium of rotary type with overlapped tracks. 4,327,430, Cl. 369-43.000.
Wagner, Eugene C. Personal oral hygiene tool. 4,326,548, Cl. 132-90.000.
Wagner, Otto C.: *See*—
Himy, Albert; and Wagner, Otto C., 4,327,157, Cl. 429-61.000.
Wagner, William R.: *See*—
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Wakui, Natsuko: *See*—
Isogai, Nobuo; Hosokawa, Motoyuki; Okawa, Takashi; and Wakui, Natsuko, 4,327,225, Cl. 560-205.000.
Walker, Jack M., to Raychem Corporation. Laminates comprising an electrode and a conductive polymer layer. 4,327,351, Cl. 338-22.00R.
Walker, Starnes E., to Phillips Petroleum Company. Comparator apparatus and process. 4,327,323, Cl. 324-61.00R.
Wallace Murray Corporation: *See*—
George, Larry T.; and Egan, Herbert W., Jr., 4,326,848, Cl. 474-135.000.
Wallis, Bernard J. Stock lifter for progressive dies. 4,326,402, Cl. 72-420.000.
Wallis, Christopher J.: *See*—
Collington, Eric W.; Hallett, Peter; and Wallis, Christopher J., 4,327,092, Cl. 424-246.000.
Wallot, George P., to General Electric Company. Fluorescent lamp power supply with low voltage lamp polarity reversal. 4,327,309, Cl. 315-170.000.
Wanek, Donald J., to International Business Machines Corporation. Transducer-carriage assembly with spring suspension. 4,327,388, Cl. 360-104.000.
Wang, Gary Y., to Transtech International Corporation. Chinese printing system. 4,327,421, Cl. 364-900.000.

Wang, Victor; and Seliger, Robert L., to Hughes Aircraft Company. Alignment process using serial detection of repetitively patterned alignment marks. 4,327,292, Cl. 250-491.000.

Wat, Karen K.: *See—*
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Watanabe, Hiroyuki: *See—*
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Watanabe, Minoru: *See—*
Kurosaki, Shiro; Watanabe, Minoru; and Usui, Yuichi, 4,326,869, Cl. 65-3.140.

Watanabe, Saburo, to Tomy Kogyo, Co., Inc. Toy simulating steam locomotive, and whistle. 4,326,355, Cl. 46-44.000.

Watanabe, Yoshimoto: *See—*
Masuda, Takayoshi; Honjo, Masaru; Takase, Tsutomu; and Watanabe, Yoshimoto, 4,327,183, Cl. 435-274.000.

Watkins, Bruce J., to Regan Offshore International, Inc. Method of releasably connecting a pair of pipes. 4,326,328, Cl. 29-464.000.

Watkins, Bruce J., to Regan Offshore International, Inc. Kelly packing and stripper seal protection element. 4,326,584, Cl. 166-82.000.

Watson, John D., Sr.; and Bauman, William C., to Dow Chemical Company, The. Multiple bed filtering apparatus and process. 4,326,963, Cl. 210-792.000.

Weber, Adam: *See—*
Botz, Jakob; Feger, Rolf; Mutschler, Erich; Spazierer, Hubert; and Weber, Adam, 4,327,264, Cl. 200-295.000.

Weber, Gary W.: *See—*
Murata, Yorihiro; and Weber, Gary W., 4,327,186, Cl. 501-92.000.

Weber, Richard G., to Machlett Laboratories, Inc., The. Rotatable X-ray target having off-focal track coating. 4,327,305, Cl. 313-330.000.

Weemes, Doyle A.; and Seymour, Robert W., to Eastman Kodak Company. Polymeric molding compositions having the high impact strength. 4,327,198, Cl. 525-63.000.

Wehner, Wolfgang; Muller, Horst; and Kostler, Hans-Gunter, to Ciba-Geigy Corporation. Organotin compounds, and their use. 4,327,016, Cl. 524-180.000.

Wei, Peter H. L., to American Home Products Corporation. 2-Substituted-3-hydroxythiazolo(2,3-8)-thiazolium salts and mesoionic didehydro derivatives thereof. 4,327,221, Cl. 548-154.000.

Weigert, Kurt; and Molz, Claudius, to Siemens Aktiengesellschaft. Method and apparatus for analysis of essentially periodic signal sequences. 4,326,538, Cl. 128-702.000.

Weinstock, Joseph: *See—*
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Weith, Alois, to STAMAG Stadkauer Malzfabrik Aktiengesellschaft. Bakery products consisting predominantly of bran and method of producing them. 4,327,116, Cl. 426-19.000.

Welch, Melvin B.; Dietz, Richard E.; and Capshew, Charles E., to Phillips Petroleum Company. Catalyst, method of producing the catalyst, and polymerization process employing the catalyst. 4,326,988, Cl. 252-429.00B.

Welz, Ronald C., to Southern California Edison Company. Anti-theft electric meter. 4,327,324, Cl. 324-110.000.

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Werner, Beat, to Thermowag AG. Support plate for guiding heating pipes of a floor or wall heating system. 4,326,366, Cl. 52-220.000.

Werner Glatt GmbH: *See—*
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Wertz, John L., to General Motors Corporation. Blade platform seal for ceramic/metal rotor assembly. 4,326,835, Cl. 416-193.00A.

West, Archie; and Radadia, Dhirajlal B., to Gulf & Western Manufacturing Company. Low smoke polyolefin jacket composition for electrical wire. 4,327,001, Cl. 524-322.000.

West, Robert W.; Stott, Paul E.; and Ahnemiller, James, to Uniroyal, Inc.; and Alpha Chemical Corporation. Method for producing expanded and cured polyester resin. 4,327,196, Cl. 521-120.000.

Westerlund, Sture, to KemaNord AB. Electrolytic cell. 4,326,941, Cl. 204-268.000.

Western Electric Company, Inc.: *See—*
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Western Publishing Company, Inc.: *See—*
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Westinghouse Electric Corp.: *See—*
Alvino, William M.; Hammill, Janet L.; and Seidel, Martin P., 4,327,143, Cl. 428-236.000.
Cadwell, Dennis J., 4,326,921, Cl. 376-353.000.
Ferrari, Harry M.; and Dollard, Walter J., 4,326,922, Cl. 376-435.000.
Frank, William E., 4,327,268, Cl. 219-10.770.
Glatthorn, Raymond, 4,327,269, Cl. 219-60.200.
Hill, Donald J., 4,326,919, Cl. 376-267.000.
Hopkins, Melvyn D.; and Bolin, Philip C., 4,327,243, Cl. 174-14.00R.
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Weyerhaeuser Company: *See—*
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Yancey, Michael J., 4,326,590, Cl. 171-61.000.

Weyers, Paul F. R., to Lockheed Missiles & Space Company, Inc. Wave-powered motor. 4,327,296, Cl. 290-53.000.

Wheadon, Ellis G., to General Motors Corporation. Half-envelope separator assemblies on individual plates. 4,327,163, Cl. 429-139.000.

Wheelabrator-Frye, Inc.: *See—*
Tillinghast, John A., 4,327,058, Cl. 422-232.000.

White, Alan D.: *See—*
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White Consolidated Industries, Inc.: *See—*
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White, Donald L.: *See—*
Feldman, Martin; White, Alan D.; and White, Donald L., 4,326,805, Cl. 356-399.000.

White, George H., to National Gypsum Company. High density interface gypsum board and method for making same. 4,327,146, Cl. 428-308.800.

White, James A.; Rice, Frank L.; and Lewis, Walter E., to General Electric Company. Ventilation system for combination microwave oven and exhaust vent. 4,327,274, Cl. 219-10.55R.

White, William T.; Clemons, Johnny M.; and Ledbetter, Frank E., III, to United States of America, National Aeronautics and Space Administration. Method of bonding plasticized elastomer to metal and articles produced thereby. 4,327,150, Cl. 428-332.000.

Whitney, Douglass G.; and Martin, John K., III. Self contained injection system. 4,326,517, Cl. 128-214.00F.

Widmer, Colin F., to James Brown & Sons, Ltd. Electrode clamp. 4,326,770, Cl. 339-278.00C.

Widmer, Georges: *See—*
Bendit, Jean-Pierre; Pellaux, Jean-Paul; and Widmer, Georges, 4,326,870, Cl. 65-4.210.

Wilcox, David G.: *See—*
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Wilcox, Milton E., to National Semiconductor Corporation. AGC Current source. 4,327,333, Cl. 330-278.000.

Wilder, Lawrence B., to Standard Oil Company (Indiana). Method for stressing thermal well casings. 4,326,586, Cl. 166-285.000.

Wilken, Joachim: *See—*
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Wilken, Robert J. Liquid tank anti-theft device. 4,326,641, Cl. 220-86.0AT.

Wilkinson, David J.: *See—*
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Williams, Charles: *See—*
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Williams, Virgil R.; and Williams, James M., Jr., 4,326,362, Cl. 51-417.000.

Williams, Robert D.: *See—*
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Williams, Ronald A., to Baxter Travenol Laboratories, Inc. Separable integral donor connector with manual clamping means. 4,326,518, Cl. 128-214.200.

Williams, Virgil R.; and Williams, James M., Jr. Shot blast machine. 4,326,362, Cl. 51-417.000.

Willis, Brian J.; and Eilerman, Robert G., to Fritzsche Dodge & Olcott Inc. Fragrance composition comprising substituted cyclohexane derivatives. 4,326,996, Cl. 252-522.00R.

Willis, Brian J.; Eilerman, Robert G.; and Yurecko, John M., Jr., to Fritzsche Dodge & Olcott Inc. Fragrance compositions of alicyclic ketone and alcohol derivatives. 4,326,997, Cl. 252-522.00R.

Willis, Dudley L. Techniques for the storage of water. 4,326,818, Cl. 405-55.000.

Wilson, Dennis C. W., to United States of America, Energy. Dye filled security seal. 4,326,741, Cl. 292-307.00R.

Wilson, Jim: *See—*
McAllister, John H.; Stewart, Lindsay G.; Gladysz, Carl V.; and Wilson, Jim, 4,326,887, Cl. 75-257.000.

Winand, Rene, to "Metallurgie Hoboken - Overpelt". Device for electrolyzing metals. 4,326,942, Cl. 204-275.000.

Windyka, Richard A.: *See—*
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Winter, John M., Jr.: *See—*
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Wintringham, Henry J., to Southland Manufacturing Co., Inc. Lubricator pad and method. 4,327,144, Cl. 428-264.000.

Wirth, Hermann O.: *See—*
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Wirz, Arno; Sobotta, Peter; Arendt, Franz; and Gramlich, Otto K., to Heidelberger Druckmaschinen Aktiengesellschaft. Sheet-guiding foil as a covering for impression cylinders. 4,327,135, Cl. 428-600.000.

Wissmann, Michael: *See—*
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Wixon, Harold E., to Colgate Palmolive Company. Detergent softener compositions. 4,326,971, Cl. 252-8.750.
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Wolf, Karl: *See—*
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Wolfrom, Glen W.; Williams, Robert D.; Peeler, Herbert T.; and Ivy, Richard E., to International Minerals & Chemical Corp. Method of supplying micronutrients to animals. 4,326,523, Cl. 128-260.000.
Wollangk, Edward G.; and Lilaonitkul, Amnuey, to Kimberly-Clark Corporation. Microwave heat setting of tampon. 4,326,527, Cl. 128-285.000.
Wong, Thomas M.; and Patel, Mahendra R., to E. R. Squibb & Sons, Inc. Novel Bendroflumethiazide formulations and method. 4,327,080, Cl. 424-80.000.
Wood, Prentice J., to Mead Corporation, The. Bottle carrier. 4,326,628, Cl. 206-158.000.
Woodtech, Inc.: *See—*
Ingram, Harry T.; and Ingram, Larry R., 4,326,572, Cl. 144-133.00R.
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Worley, Arthur C.: *See—*
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Worms, Karl-Heinz: *See—*
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Woychio, Stephen; and Spector, George. Folding cart. 4,326,731, Cl. 280-641.000.
Wroblewski, Theodore, to Frequency, Technology, Inc. Inductor-capacitor impedance devices and method of making the same. 4,327,311, Cl. 315-244.000.
Wu, Philip T., to International Business Machines Corporation. Read-only storage using enhancement-mode, depletion-mode or omitted gate field-effect transistors. 4,327,424, Cl. 365-104.000.
Wurtman, Richard J., to Massachusetts Institute of Technology. Process for increasing blood pressure. 4,327,112, Cl. 424-319.000.
Xerox Corporation: *See—*
Kadakia, Vinod K.; Jones, Glen D.; Parikh, Kedar D.; and Rider, Ronald E., 4,327,379, Cl. 358-261.000.
Lavery, Lawrence P.; Wilcox, David G.; and Thomas, Dale C., 4,326,646, Cl. 222-56.000.
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Yagitani, Takayuki; and Ebisu, Osamu, to Shizuki Electric Co., Inc. Metallized polypropylene film capacitor. 4,327,395, Cl. 361-326.000.
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Yamada, Mitsuhiko; and Nakade, Toshiaki, to Dainippon Screen Seizo Kabushiki Kaisha. Control method for reproduction picture positions in a direction of a cylinder's axis. 4,327,380, Cl. 358-264.000.
Yamaguchi, Ryoji: *See—*
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Yamaguchi, Totaro: *See—*
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Yamashita, Chikao; Sugaya, Takao; and Yoshida, Noriyuki, to Brother Kogyo Kabushiki Kaisha. Needle oscillating mechanism for a sewing machine. 4,326,472, Cl. 112-158.00D.
Yancey, Michael J., to Weyerhaeuser Company. Plant-harvesting device for use with variable crop row spacing. 4,326,590, Cl. 171-61.000.
Yano, Kiyotosi: *See—*
Ishikawa, Eizi; Matsuura, Ryouichi; and Yano, Kiyotosi, 4,326,696, Cl. 251-129.000.
Yashima, Nobuyoshi: *See—*
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Yasuda, Eturo; and Ohta, Minoru, to Nippon Soken, Inc. Gas sensor assembly. 4,327,054, Cl. 422-95.000.
Yasuda, Takashi: *See—*
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Tajima, Hatsuo; Iwami, Naoki; Masuda, Shunichi; Shimizu, Katsuichi; Kawatsura, Yoshihiro; Suzuki, Koji; and Yokomizo, Yoshikazu, 4,326,795, Cl. 355-14.00E.
Yokota, Yukio: *See—*
Aoki, Kozo; Seoka, Yoshio; and Yokota, Yukio, 4,327,173, Cl. 430-505.000.
Yokoyama, Masaaki: *See—*
Nishikawa, Shigeo; and Yokoyama, Masaaki, 4,327,045, Cl. 264-51.000.
Yoneda, Kenji: *See—*
Kuzunuki, Soshiro; Hirasawa, Kotaro; Sakata, Kazuhiro; and Yoneda, Kenji, 4,326,606, Cl. 187-29.00R.
Yorktowne Paper Mills, Inc.: *See—*
Ballerstein, George B.; and Kimmel, Spurgeon E., 4,326,438, Cl. 82-53.100.
Yoshida, Chosaku: *See—*
Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,327,097, Cl. 424-250.000.
Yoshida, Kooichi: *See—*
Matsuda, Akira; Yoshioka, Osamu; Takahashi, Katsutoshi; Yoshida, Kooichi; and Ninomiya, Hiroshi, 4,327,081, Cl. 424-81.000.
Yoshida, Nobuo: *See—*
Inouye, Ken; Kono, Masao; Yoshida, Nobuo; Nakamura, Masuhisa; Okabayashi, Tadashi; and Igano, Ken'ichi, 4,327,072, Cl. 424-1.000.
Yoshida, Noriyuki: *See—*
Yamashita, Chikao; Sugaya, Takao; and Yoshida, Noriyuki, 4,326,472, Cl. 112-158.00D.
Yoshii, Takashi: *See—*
Murayama, Yoshinobu; and Yoshii, Takashi, 4,326,597, Cl. 180-70.0MS.
Yoshimi, Toshikazu; and Ono, Hiroshi, to Pioneer Electronic Corporation, a part interest. Audio amplifier device. 4,327,331, Cl. 330-126.000.
Yoshimura, Hirofumi: *See—*
Ikeda, Nobuo; and Yoshimura, Hirofumi, 4,327,267, Cl. 219-10.55F.
Yoshinaga, Shoji: *See—*
Fujiwara, Kiyoshi; Nagatomo, Katsuaki; Yoshinaga, Shoji; Tamura, Zensuke; Shibata, Fumio; and Kanekiyo, Hiroshi, 4,326,666, Cl. 233-15.000.
Yoshioka, Osamu: *See—*
Matsuda, Akira; Yoshioka, Osamu; Takahashi, Katsutoshi; Yoshida, Kooichi; and Ninomiya, Hiroshi, 4,327,081, Cl. 424-81.000.
Young, Donald C., to Union Oil Company of California. Sulfur product and method. 4,326,875, Cl. 71-11.000.
Young, Hugh J.: *See—*
Loftus, Barry N.; and Young, Hugh J., 4,326,738, Cl. 292-172.000.
Yuka Badische Company Limited: *See—*
Nishikawa, Shigeo; and Yokoyama, Masaaki, 4,327,045, Cl. 264-51.000.
Yukl, Tex N., to Spatial Dynamics, Ltd. Bidirectional current supply circuit. 4,327,322, Cl. 323-351.000.
Yurecko, John M., Jr.: *See—*
Willis, Brian J.; Eilerman, Robert G.; and Yurecko, John M., Jr., 4,326,997, Cl. 252-522.00R.
Zacharias, Theodor; and Diel, Hartmut, to Friedrich Kocks GmbH & Company. Method and apparatus for feeding, clamping, and removal of bar of tube goods. 4,326,623, Cl. 198-345.000.
Zaczek, Thomas E., to Martin Marietta Corporation. Antenna scan pattern generator. 4,327,417, Cl. 364-578.000.
Zang, Hyung K., to Texaco Inc. Coal liquefaction. 4,326,948, Cl. 208-177.000.
Zardi, Umberto: *See—*
Lagana, Vincenzo; and Zardi, Umberto, 4,327,068, Cl. 423-359.000.
Zeidler, Georg: *See—*
Eilingsfeld, Heinz; Hansen, Guenter; Seybold, Guenther; and Zeidler, Georg, 4,327,019, Cl. 260-158.000.
Zelahy, John W.; and Raeburn, Alexander, Jr., to General Electric Company. Method and replacement member for repairing a gas turbine engine blade member. 4,326,833, Cl. 416-96.00R.
Zellner, Wilhelm: *See—*
Leonhardt, Fritz; Andra, Wolfhart; Zellner, Wilhelm; Schlaich, Jorg; and Mayr, Gunter, 4,326,363, Cl. 52-80.000.
Zenith Radio Corporation: *See—*
Hockenbrock, Richard L.; and Schwartz, James W., 4,326,762, Cl. 316-1.000.
Ziegelheim, Irwin I.; and Lerner, Lawrence. Work stations of knock-down modular components. 4,326,760, Cl. 312-257.00R.
Zilch, Karl T.: *See—*
McVay, Kenneth R.; Lakes, Stephen C.; and Zilch, Karl T., 4,327,030, Cl. 260-407.000.
Ziman, Stephen D., to Chevron Research. Herbicidal and plant-growth-regulating 1,2,4-trisubstituted-1,2,4-triazolidin-3,5-dithiones. 4,326,878, Cl. 71-92.000.
Zimerman, Clota E. Intrauterine contraceptive device. 4,326,511, Cl. 128-130.000.

Ziyad Incorporated: *See*—
Kapp, Ludwig J., 4,326,815, Cl. 400-625.000.
Zochbauer, Michael, to Hartmann & Braun Aktiengesellschaft. Photoelectric gas analyzer. 4,326,807, Cl. 356-418.000.
Zuech, Ernest A.: *See*—
Mark, Harold W.; and Zuech, Ernest A., 4,326,990, Cl. 252-431.00C.
Zumbahlen, Louis H., Jr.; and Volkland, Charles, to Halcyon, Inc. Method and apparatus for rapid evaluation of parameters affecting voiceband data transmission. 4,327,258, Cl. 179-175.30R.
Zuptichini, Sebastian: *See*—
Colognori, Aldo, 4,326,321, Cl. 24-265.00B.
Zylbert, Thaddeus J., to Singer Company, The. In-place bobbin winding mechanism for a sewing machine. 4,326,474, Cl. 112-184.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF APRIL, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Cartwright, Cyril A.; Emmett, James S.; Michael, Arthur E.; Peleckis, Anthony J.; and Symes, Ernest M., to Warner-Lambert Company. Safety razor with flexible blade cartridge. Re. 30,913, Cl. 30-47.000.

Chisum, Finis L. Truck frame alignment apparatus. Re. 30,914, Cl. 72-457.000.

Emmett, James S.: *See*—
Cartwright, Cyril A.; Emmett, James S.; Michael, Arthur E.; Peleckis, Anthony J.; and Symes, Ernest M., Re. 30,913, Cl. 30-47.000.

Hagiwara, Yoshiaki; and Yamazaki, Hiroshi, to Sony Corporation. Two-phase charge transfer device image sensor. Re. 30,917, Cl. 357-24.000.

Hancock Laboratories, Inc.: *See*—
Hancock, Warren D., Re. 30,912, Cl. 3-1.500.

Hancock, Warren D., to Hancock Laboratories, Inc. Stent for heart valve. Re. 30,912, Cl. 3-1.500.

Ishizaka, Sunao, to Nippon Kogaku K.K. Aperture interlocking device for a single lens reflex camera of the interchangeable viewfinder type. Re. 30,915, Cl. 354-219.000.

McWaters, Lynn, to Recognition Equipment Incorporated. Wand turn-on control. Re. 30,916, Cl. 250-214.00R.

Michael, Arthur E.: *See*—
Cartwright, Cyril A.; Emmett, James S.; Michael, Arthur E.; Peleckis, Anthony J.; and Symes, Ernest M., Re. 30,913, Cl. 30-47.000.

Nippon Kogaku K.K.: *See*—
Ishizaka, Sunao, Re. 30,915, Cl. 354-219.000.

Peleckis, Anthony J.: *See*—
Cartwright, Cyril A.; Emmett, James S.; Michael, Arthur E.; Peleckis, Anthony J.; and Symes, Ernest M., Re. 30,913, Cl. 30-47.000.

Recognition Equipment Incorporated: *See*—
McWaters, Lynn, Re. 30,916, Cl. 250-214.00R.

Sony Corporation: *See*—
Hagiwara, Yoshiaki; and Yamazaki, Hiroshi, Re. 30,917, Cl. 357-24.000.

Symes, Ernest M.: *See*—
Cartwright, Cyril A.; Emmett, James S.; Michael, Arthur E.; Peleckis, Anthony J.; and Symes, Ernest M., Re. 30,913, Cl. 30-47.000.

Warner-Lambert Company: *See*—
Cartwright, Cyril A.; Emmett, James S.; Michael, Arthur E.; Peleckis, Anthony J.; and Symes, Ernest M., Re. 30,913, Cl. 30-47.000.

Yamazaki, Hiroshi: *See*—
Hagiwara, Yoshiaki; and Yamazaki, Hiroshi, Re. 30,917, Cl. 357-24.000.

LIST OF DESIGN PATENTEES

A. Ahlstrom Osakeyhtio: *See*—
Sarpaneva, Timo, 264,035, Cl. D7-13.000.

AB Karlshamns Plastindustri: *See*—
Sundin, Harry, 264,137, Cl. D28-37.000.

Abbott Laboratories: *See*—
Genese, Joseph N., 264,132, Cl. D24-54.000.
Genese, Joseph N., 264,133, Cl. D24-54.000.

Adams, Steve D., Jr. Telephone. 264,076, 4-27-82, Cl. D14-53.000.

AMBA Marketing Systems, Inc.: *See*—
Schimmel, Otto K., 264,019, Cl. D3-52.000.
Schimmel, Otto K., 264,020, Cl. D3-52.000.
Schimmel, Otto K., 264,021, Cl. D3-53.000.

American Sterilizer Company: *See*—
Brendgord, Thomas; and Sestak, Joseph T., 264,123, Cl. D24-9.000.
Brendgord, Thomas; and Sestak, Joseph T., 264,124, Cl. D24-9.000.

AMF Incorporated: *See*—
Sorensen, Egon, 264,031, Cl. D6-173.000.

Arbonite Corporation: *See*—
MacKnight-Thomson, Ian D., 264,071, Cl. D13-17.000.
MacKnight-Thomson, Ian D., 264,071, Cl. D13-17.000.

Aronowitz, Robert J.; and Katzanek, Bernard D., to Robert Bernard Associates. Chair. 264,027, 4-27-82, Cl. D6-66.000.

Ashman, Jack A.: *See*—
Reid, Steven J.; and Ashman, Jack A., 264,089, Cl. D15-199.000.

Bailey, Alan H., to USM Corporation. Combined dispenser cap and separable closure plug therefor. 264,052, 4-27-82, Cl. D9-449.000.

Barnes, Bruce J.; and Hendrix, Robert H., to Keuffel & Esser Company. Patient monitor or the like. 264,128, 4-27-82, Cl. D24-17.000.

Barr, Josef J. Finger ring or similar article. 264,059, 4-27-82, Cl. D11-34.000.

Bass Pro Shops, Inc.: *See*—
Morris, John L., 264,094, Cl. D16-102.000.

Bedel, Dennis E.: *See*—
Zwillich, Alexander; and Bedel, Dennis E., 264,135, Cl. D26-71.000.

Bennett, Lester H., to Bon-Aire Industries, Inc. Vacuum cleaner. 264,087, 4-27-82, Cl. D32-23.000.

Biggs, Anthony J. Dental pin. 264,125, 4-27-82, Cl. D24-10.000.

Bon-Aire Industries, Inc.: *See*—
Bennett, Lester H., 264,087, Cl. D32-23.000.

Brendgord, Thomas; and Sestak, Joseph T., to American Sterilizer Company. Sterilizer. 264,123, 4-27-82, Cl. D24-9.000.

Brendgord, Thomas; and Sestak, Joseph T., to American Sterilizer Company. Sterilizer. 264,124, 4-27-82, Cl. D24-9.000.

Castiglioni, Achille. Ceiling lamp. 264,136, 4-27-82, Cl. D26-85.000.

Cech, Pavel, to Supercool AB. Heat pump. 264,119, 4-27-82, Cl. D23-136.000.

Cities Service Company: *See*—
Kunze, Walter A., 264,040, Cl. D32-37.000.

Clay, Tymen. Pump for a manure handling system or the like. 264,085, 4-27-82, Cl. D15-7.000.

Colato, Albert E.: *See*—
Pomroy, James F.; and Colato, Albert E., 264,036, Cl. D7-94.000.

Collins, Samuel T., to Trend Line Furniture Corporation. Table. 264,030, 4-27-82, Cl. D6-153.000.

Criveller, Luigi. Chocolate Christmas tree. 264,015, 4-27-82, Cl. D1-19.000.

Cutler, Marvin. Dental accessory cabinet. 264,126, 4-27-82, Cl. D24-10.000.

Datagraphix, Inc.: *See*—
Link, William T.; and Hobson, Stephen, 264,091, Cl. D16-18.000.

Dewees, John G.: *See*—
Franklin, Robert P.; and Dewees, John G., 264,025, Cl. D6-24.000.

Dewhurst, Dennis K. Fire combustor. 264,121, 4-27-82, Cl. D23-161.000.

Dinnocente, Eugeno P. Skateboard scooter. 264,105, 4-27-82, Cl. D21-81.000.

Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Combined display and dispenser for candy containers or the like. 264,034, 4-27-82, Cl. D6-189.000.

DuBois, R. Clark; and Hamma, John C., to Gradco/Dendoki, Inc. Continuous form feeding and copying apparatus. 264,092, 4-27-82, Cl. D16-30.000.

Edwards, Luther E. Tire implement or the like. 264,043, 4-27-82, Cl. D8-31.000.

Electric Fuel Propulsion Corp.: *See*—
Lauve, Henry D., 264,068, Cl. D12-91.000.

Elliot, James M.; Rickel, Eric A.; and Rickel, Terri F. Adjustable electrical cord clamp. 264,045, 4-27-82, Cl. D8-355.000.

Entex Industries, Inc.: *See*—
Hanzawa, Tsuneo, 264,099, Cl. D21-13.000.
Hanzawa, Tsuneo, 264,100, Cl. D21-13.000.
Hanzawa, Tsuneo, 264,101, Cl. D21-13.000.

Epstein, Elias, to Kaspar & Esh, Inc. Earring. 264,060, 4-27-82, Cl. D11-40.000.

Ervan Guttman Company, The: *See*—
Guttman, Ervan E., 264,038, Cl. D7-103.000.
Europlastic B.V.: *See*—
Gompes, Simon, 264,104, Cl. D21-65.000.
Fournier, Mark E. Head mounted fan. 264,016, 4-27-82, Cl. D2-253.000.
Franklin, Robert P.; and Dewees, John G., to Trans-World Manufacturing Corp. Eyeglass display rack. 264,025, 4-27-82, Cl. D6-24.000.
Fukushima, Hisao; and Hirooka, Junji, to Oki Electric Industry Co., Ltd. Telephone set. 264,077, 4-27-82, Cl. D14-53.000.
Fukushima, Hisao; and Hirooka, Junji, to Oki Electric Industry Co., Ltd. Portable wireless telephone set. 264,078, 4-27-82, Cl. D14-53.000.
Genese, Joseph N., to Abbott Laboratories. Flexible stylet. 264,132, 4-27-82, Cl. D24-54.000.
Genese, Joseph N., to Abbott Laboratories. Flexible stylet. 264,133, 4-27-82, Cl. D24-54.000.
Gingher, Clair H., Jr., to Gingher, Inc. Thread snips. 264,018, 4-27-82, Cl. D3-18.000.
Gingher, Inc.: *See*—
Gingher, Clair H., Jr., 264,018, Cl. D3-18.000.
Gompes, Simon, to Europlastic B.V. Toy rattle. 264,104, 4-27-82, Cl. D21-65.000.
Gordan, Miroslav. Necklace with illuminable pendant. 264,058, 4-27-82, Cl. D11-7.000.
Gradco/Dendoki, Inc.: *See*—
DuBois, R. Clark; and Hamma, John C., 264,092, Cl. D16-30.000.
Lawrence, Frederick J., 264,093, Cl. D16-31.000.
Grae, Bernard A., to Tandy Corporation. Printer housing. 264,083, 4-27-82, Cl. D14-111.000.
Guttman, Ervan E., to Ervan Guttman Company, The. Candy dipping tool. 264,038, 4-27-82, Cl. D7-103.000.
Hamma, John C.: *See*—
DuBois, R. Clark; and Hamma, John C., 264,092, Cl. D16-30.000.
Hanzawa, Tsuneo, to Entex Industries, Inc. Electronic hand-held space battle game housing or the like. 264,099, 4-27-82, Cl. D21-13.000.
Hanzawa, Tsuneo, to Entex Industries, Inc. Hand-held electronic baseball game housing or the like. 264,100, 4-27-82, Cl. D21-13.000.
Hanzawa, Tsuneo, to Entex Industries, Inc. Hand-held electronic game housing or the like. 264,101, 4-27-82, Cl. D21-13.000.
Harden, Richard L. Hay bale feeder. 264,138, 4-27-82, Cl. D30-13.000.
Hendrix, Robert H.: *See*—
Barnes, Bruce J.; and Hendrix, Robert H., 264,128, Cl. D24-17.000.
Hirooka, Junji: *See*—
Fukushima, Hisao; and Hirooka, Junji, 264,077, Cl. D14-53.000.
Fukushima, Hisao; and Hirooka, Junji, 264,078, Cl. D14-53.000.
Hobson, Stephen: *See*—
Link, William T.; and Hobson, Stephen, 264,091, Cl. D16-18.000.
Honeywell, Inc.: *See*—
Peterson, Dean M., 264,127, Cl. D24-17.000.
Howard, Jan. Play mat. 264,102, 4-27-82, Cl. D21-23.000.
Hsiao, James C.: *See*—
Sullivan, James H.; and Hsiao, James C., 264,088, Cl. D15-69.000.
Hutcheson, Claude H., to Xerox Corporation. Media converter unit for a magnetic card for data processing display system. 264,082, 4-27-82, Cl. D14-107.000.
Imperial Plastics Corporation: *See*—
Smith, Cecil H.; and Mohraz, Bijan, 264,066, Cl. D34-38.000.
Inaga, Hisashi; and Nogawa, Masato, to Kioritz Corporation. Blade for power scythe. 264,042, 4-27-82, Cl. D8-20.000.
Ito, Kenichi: *See*—
Sekita, Isao; Suzuki, Kiyoshi; Sugisaki, Kazuyoshi; Ito, Kenichi; Yamamoto, Masaki; and Mano, Kazunori, 264,081, Cl. D14-70.000.
Iwata, Keisuke. Paging receiver. 264,080, 4-27-82, Cl. D14-70.000.
Jensen, Charles. Freestanding fireplace. 264,117, 4-27-82, Cl. D23-97.000.
Jimison, James W.: *See*—
Jimison, Walter L.; and Jimison, James W., 264,111, Cl. D21-226.000.
Jimison, Walter L.; and Jimison, James W. Accessory housing for skate, skateboard, bicycle or the like. 264,111, 4-27-82, Cl. D21-226.000.
John J. Madison Company, Inc.: *See*—
Santa Eulalia, Jesus A. C.; and Santa Eulalia, Javier B. C., 264,061, Cl. D11-158.000.
Johnson, Ruth M. Oven rack moving tool. 264,037, 4-27-82, Cl. D7-99.000.
Johnston, Joe: *See*—
Lucas, George W.; McQuarrie, Ralph; and Johnston, Joe, 264,109, Cl. D21-150.000.
Jones, Jane E. Art palette. 264,096, 4-27-82, Cl. D19-35.000.
Jonsson, Nils G., to National Service Industries, Inc. Electrical connector. 264,072, 4-27-82, Cl. D13-24.000.
Jonsson, Nils G., to National Service Industries, Inc. Electrical connector. 264,073, 4-27-82, Cl. D13-24.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Suzuki, Susumu, 264,055, Cl. D10-38.000.
Suzuki, Susumu, 264,056, Cl. D10-38.000.
Karakawa, Kazuo. Cover for heat insulating material around elbow or the like. 264,120, 4-27-82, Cl. D23-137.000.
Kaspar & Esh, Inc.: *See*—
Epstein, Elias, 264,060, Cl. D11-40.000.
Katzanek, Bernard D.: *See*—
Aronowitz, Robert J.; and Katzanek, Bernard D., 264,027, Cl. D6-66.000.
Kellogg, Dorothy H. Book stand. 264,028, 4-27-82, Cl. D6-184.000.
Keuffel & Esser Company: *See*—
Barnes, Bruce J.; and Hendrix, Robert H., 264,128, Cl. D24-17.000.
Kieber, Lothar. Spray can cap. 264,054, 4-27-82, Cl. D9-453.000.
Kioritz Corporation: *See*—
Inaga, Hisashi; and Nogawa, Masato, 264,042, Cl. D8-20.000.
Kunze, Walter A., to Cities Service Company. Laundry basket. 264,040, 4-27-82, Cl. D32-37.000.
Kuramoto, Takeo, to Kyoritsu Electrical Instruments Works, Ltd. Volt-ohm-ammeter or the like. 264,057, 4-27-82, Cl. D10-79.000.
Kyoritsu Electrical Instruments Works, Ltd.: *See*—
Kuramoto, Takeo, 264,057, Cl. D10-79.000.
Lauve, Henry D., to Electric Fuel Propulsion Corp. Automobile. 264,068, 4-27-82, Cl. D12-91.000.
Lawrence, Frederick J., to Gradco/Dendoki, Inc. Copying and sorting apparatus. 264,093, 4-27-82, Cl. D16-31.000.
Lazazzera, Achille. Car door unlocking and locking device. 264,044, 4-27-82, Cl. D8-88.000.
Lear Siegler, Inc.: *See*—
Pareja, Ramon, 264,086, Cl. D15-7.000.
Levy, Michael. Loud speaker enclosure. 264,075, 4-27-82, Cl. D14-33.000.
Link, William T.; and Hobson, Stephen, to Datagraphix, Inc. Desk drawer microfiche reader. 264,091, 4-27-82, Cl. D16-18.000.
Lucas, George W.; McQuarrie, Ralph; and Johnston, Joe, to Lucasfilm, Ltd. Toy action figure. 264,109, 4-27-82, Cl. D21-150.000.
Lucasfilm, Ltd.: *See*—
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M & M Luggage Co., Inc.: *See*—
Stark, Ted, 264,023, Cl. D3-71.000.
Stark, Ted, 264,024, Cl. D3-71.000.
Ma, Han S.; and Melnik, Michael. Dispenser spout for a squeeze-type container. 264,053, 4-27-82, Cl. D9-442.000.
MacKnight-Thomson, Ian D., to Arbonite Corporation; and Arbonite Corporation. Insulator for battery connectors. 264,071, 4-27-82, Cl. D13-17.000.
Maeda Industries, Ltd.: *See*—
Ozaki, Nobuo, 264,069, Cl. D12-124.000.
Magner, Bengt, to Opto-System AB. Coupling. 264,046, 4-27-82, Cl. D8-382.000.
Magner, Bengt, to Opto-System AB. Coupling. 264,047, 4-27-82, Cl. D8-382.000.
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Magner, Bengt, to Opto-System AB. Coupling. 264,050, 4-27-82, Cl. D8-382.000.
Mano, Kazunori: *See*—
Sekita, Isao; Suzuki, Kiyoshi; Sugisaki, Kazuyoshi; Ito, Kenichi; Yamamoto, Masaki; and Mano, Kazunori, 264,081, Cl. D14-70.000.
Markus, Frederick E. Shelving unit. 264,033, 4-27-82, Cl. D6-186.000.
Mascheroni, John. Sofa. 264,026, 4-27-82, Cl. D6-61.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
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Matsuura, Iwao, to Nissho Corporation. Medical multiport valve cock. 264,131, 4-27-82, Cl. D24-53.000.
Mayuzumi, Masaki, to Tomy Kogyo Co., Inc. Pocket game. 264,097, 4-27-82, Cl. D21-9.000.
Mayuzumi, Masaki, to Tomy Kogyo Co., Inc. Pocket size game box. 264,098, 4-27-82, Cl. D21-10.000.
McQuarrie, Ralph: *See*—
Lucas, George W.; McQuarrie, Ralph; and Johnston, Joe, 264,109, Cl. D21-150.000.
Medical Research Associates, Ltd.: *See*—
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Melnik, Michael: *See*—
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Miyake, Takao: *See*—
Suganoya, Yoshio; and Miyake, Takao, 264,039, Cl. D7-128.000.
Mohraz, Bijan: *See*—
Smith, Cecil H.; and Mohraz, Bijan, 264,066, Cl. D34-38.000.
Morgan, Randall E. Trolling motor tiller. 264,084, 4-27-82, Cl. D15-4.000.
Morris, John L., to Bass Pro Shops, Inc. Sunglasses. 264,094, 4-27-82, Cl. D16-102.000.
Murphy, William. Practice putting cup. 264,115, 4-27-82, Cl. D21-234.000.
National Service Industries, Inc.: *See*—
Jonsson, Nils G., 264,072, Cl. D13-24.000.
Jonsson, Nils G., 264,073, Cl. D13-24.000.
Nissho Corporation: *See*—
Matsuura, Iwao, 264,131, Cl. D24-53.000.
Nogawa, Masato: *See*—
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Nordstrom, Claes. Pallet. 264,067, 4-27-82, Cl. D34-38 000.
Oki Electric Industry Co., Ltd.: *See*—
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Fukushima, Hisao; and Hirooka, Junji, 264,078, Cl. D14-53.000.
Oosten, Roger L.; and Randall, Bruce C., to Medical Research Associates, Ltd. Electrosurgical generator. 264,122, 4-27-82, Cl. D24-8.000.

Opto-System AB: *See—*
Magner, Bengt, 264,046, Cl. D8-382.000.
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Tulipani, Victor J., 264,129, Cl. D24-38.000.
Peterson, Dean M., to Honeywell, Inc. Medical culture bottle. 264,127, 4-27-82, Cl. D24-17.000.
Peterson, Fred. Electronic telephone unit. 264,079, 4-27-82, Cl. D14-53.000.
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Pomroy, James F.; and Colato, Albert E., 264,036, Cl. D7-94.000.
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Tong, Duncan, 264,108, Cl. D21-143.000.
Pluenneke, Ricks H. Hand-held rope wick applicator. 264,041, 4-27-82, Cl. D8-02.000.
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Oosten, Roger L.; and Randall, Bruce C., 264,122, Cl. D24-8.000.
Reid, Steven J.; and Ashman, Jack A. Positioner. 264,089, 4-27-82, Cl. D15-199.000.
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Elliot, James M.; Rickel, Eric A.; and Rickel, Terri F., 264,045, Cl. D8-355.000.
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Schimmel, Otto K., to AMBA Marketing Systems, Inc. Handbag. 264,021, 4-27-82, Cl. D3-53.000.
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Brendgord, Thomas; and Sestak, Joseph T., 264,123, Cl. D24-9.000.
Brendgord, Thomas; and Sestak, Joseph T., 264,124, Cl. D24-9.000.
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Suganoya, Yoshio; and Miyake, Takao, 264,039, Cl. D7-128.000.
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Pearman, Fred E., Jr., 264,139, Cl. D32-33.000.
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Sorensen, Egon, to AMF Incorporated. Combined food pattie display and dispenser cabinet. 264,031, 4-27-82, Cl. D6-173.000.
Stark, Ted, to M & M Luggage Co., Inc. Luggage. 264,023, 4-27-82, Cl. D3-71.000.
Stark, Ted, to M & M Luggage Co., Inc. Luggage. 264,024, 4-27-82, Cl. D3-71.000.
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Supercool AB: *See—*
Cech, Pavel, 264,119, Cl. D23-136.000.
Suzuki, Kiyoshi: *See—*
Sekita, Isao; Suzuki, Kiyoshi; Sugisaki, Kazuyoshi; Ito, Kenichi; Yamamoto, Masaki; and Mano, Kazunori, 264,081, Cl. D14-70.000.
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Mayuzumi, Masaki, 264,097, Cl. D21-9.000.
Mayuzumi, Masaki, 264,098, Cl. D21-10.000.
Yoshimura, Masaaki, 264,103, Cl. D21-27.000.
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Trans-World Manufacturing Corp.: *See—*
Franklin, Robert P.; and Dewees, John G., 264,025, Cl. D6-24.000.
Trend Line Furniture Corporation: *See—*
Collins, Samuel T., 264,030, Cl. D6-153.000.
Tulipani, Victor J., to Peregrine Industries, Incorporated. Hydrotherapy spa. 264,129, 4-27-82, Cl. D24-38.000.
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Hutcheson, Claude H., 264,082, Cl. D14-107.000.
Yamamoto, Masaki: *See—*
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CLASSIFICATION OF PATENTS

ISSUED APRIL 27, 1982

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

22	4,326,299
114	4,326,300
177	4,326,301
405	4,326,302
411	4,326,303

CLASS 3

1.5	Re.30,912
	4,326,304
1.9	4,326,305
13	4,326,306

CLASS 4

236	4,326,307
420.3	4,326,308

CLASS 5

12 R	4,326,309
448	4,326,310
475	4,326,311

CLASS 12

142 D	4,326,313

CLASS 15

22 R	4,326,314
77	4,326,315
246	4,326,316
302	4,326,317

CLASS 23

230 R	4,326,850
	4,326,851
232 E	4,326,318
293 R	4,326,852

CLASS 24

70 SK	4,326,320
205.11 R	4,326,319
265 B	4,326,321

CLASS 28

187	4,326,322

CLASS 29

6	4,326,323
25.19	4,326,324
27 C	4,326,325
428	4,326,326
434	4,326,327
464	4,326,328
571	4,326,329
	4,326,330
	4,326,331
	4,326,332
598	4,326,333

CLASS 30

47	Re.30,913
124	4,326,334
254	4,326,335

CLASS 33

174 PA	4,326,337
	4,326,338
174 Q	4,326,336
191	4,326,339
238	4,326,340

CLASS 34

27	4,326,341
47	4,326,342
51	4,326,343
54	4,326,344

CLASS 36

135	4,326,345

CLASS 37

72	4,326,346
94	4,326,347
142 R	4,326,348

CLASS 40

152.1	4,326,349
310	4,326,350
467	4,326,351
607	4,326,352

CLASS 42

7	4,326,353

CLASS 44

1 F	4,326,853
10 B	4,326,854
51/	4,326,855

CLASS 46

26	4,326,354
44	4,326,355
154	4,326,356
217	4,326,357

CLASS 47

58	4,326,358
	4,326,359

CLASS 48

197 R	4,326,856
210	4,326,857

CLASS 49

63	4,326,360

CLASS 51

168	4,326,361
417	4,326,362

CLASS 52

80	4,326,363
169.7	4,326,364
204	4,326,365
220	4,326,366

CLASS 54

2	4,326,367

CLASS 55

26	4,326,858
52	4,326,859
105	4,326,860
112	4,326,861
127	4,326,862
171	4,326,863
364	4,326,864
385 B	4,326,865
479	4,326,866

CLASS 56

11.3	4,326,368
41	4,326,369
202	4,326,370

CLASS 57

87	4,326,371
88	4,326,372

CLASS 60

39.02	4,326,373
39.09 P	4,326,374
39.16 S	4,326,375
39.28 R	4,326,376
247	4,326,377
311	4,326,378
550	4,326,379
595	4,326,380
641.14	4,326,381
655	4,326,382

CLASS 62

3	4,326,383
10	4,326,867
62	4,326,384
82	4,326,385
150	4,326,386
184	4,326,387
324.6	4,326,388
	4,326,868
342	4,326,389
382	4,326,390
402	4,326,391

CLASS 64

3	4,326,392

CLASS 65

3.14	4,326,869
4.21	4,326,870
12	4,326,871
112	4,326,872
134	4,326,873

CLASS 66

172 E	4,326,393

CLASS 70

14	4,326,394
168	4,326,395
364 R	4,326,396

CLASS 71

9	4,326,874
11	4,326,875
92	4,326,877
	4,326,878
94	4,326,879
	4,326,880
95	4,326,881
090	4,326,876

CLASS 72

110	4,326,397
193	4,326,398
263	4,326,399
280	4,326,400
350	4,326,401
420	4,326,402
457	Re.30,914

CLASS 73

29	4,326,404
37	4,326,405
49.1	4,326,406
	4,326,407
49.3	4,326,408
84	4,326,409
117.3	4,326,410
155	4,326,411
204	4,326,412
313	4,326,413
336.5	4,326,414
499	4,326,415
597	4,326,416
601	4,326,417
644	4,326,418
708	4,326,419
768	4,326,420
852	4,326,421
861.22	4,326,422
861.63	4,326,423
862.48	4,326,424
863.53	4,326,425
864.59	4,326,426
864.65	4,326,427

CLASS 74

5 F	4,326,428
7 R	4,326,429
10.52	4,326,430
63	4,326,431
475	4,326,432
740	4,326,433

CLASS 75

5	4,326,883
71	4,326,884
125	4,326,885
129	4,326,886
257	4,326,887

CLASS 76

107 C	4,326,434

CLASS 81

57.34	4,326,435
165	4,326,436

CLASS 82

36 A	4,326,437
53.1	4,326,438

CLASS 83

27	4,326,439
482	4,326,440

CLASS 84

1.03	4,326,441
1.19	4,326,442
1.26	4,326,443
297 S	4,326,444

CLASS 89

36 F	4,326,445
38	4,326,446
41 H	4,326,447

CLASS 91

363 R	4,326,448
401	4,326,449
487	4,326,450

CLASS 98

2.12	4,326,451
40 VT	4,326,452
87	4,326,453

CLASS 99

451	4,326,454
483	4,326,455

CLASS 100

41	4,326,456
218	4,326,457

CLASS 101

1	4,326,458
93.30	4,326,459
110	4,326,460

CLASS 102

277	4,326,461
310	4,326,462
513	4,326,463
523	4,326,464

CLASS 104

165	4,326,465
172 S	4,326,466

CLASS 106

14.14	4,326,888
35	4,326,889
77	4,326,890
99	4,326,891

CLASS 108

51.1	4,326,467

CLASS 109

49.5	4,326,468

CLASS 110

115	4,326,469
220	4,326,470
341	4,326,471

CLASS 112

158 D	4,326,472
158 E	4,326,473
184	4,326,474

CLASS 114

39	4,326,475
40	4,326,476
67 A	4,326,477
183 R	4,326,478
248	4,326,479

CLASS 118

50	4,326,480

CLASS 119

1	4,326,481
52 B	4,326,482

CLASS 123

3	4,326,483
90.5	4,326,484
180 AC	4,326,485
418	4,326,486
453	4,326,487
492	4,326,488
520	4,326,489
557	4,326,490
	4,326,491
	4,326,492
606	4,326,493

CLASS 125

12	4,326,494

CLASS 126

77	4,326,495
164	4,326,496
261	4,326,497
415	4,326,498
420	4,326,499
426	4,326,500
430	4,326,501
439	4,326,502
443	4,326,503
449	4,326,504

CLASS 127

43	4,326,892

CLASS 128

1 R	4,326,505
33	4,326,506
54	4,326,507
57	4,326,508
90	4,326,509
127	4,326,510
130	4,326,511
151	4,326,512
202.22	4,326,514
203.14	4,326,513
207.17	4,326,515
214 F	4,326,517
214 R	4,326,516
214.2	4,326,518
214.4	4,326,519
	4,326,520
260	4,326,522
	4,326,523
	4,326,524
	4,326,525
272	4,326,526
283	4,326,521
285	4,326,527
287	4,326,528
303.1	4,326,529
303.14	4,326,530
326	4,326,531
349 R	4,326,532
402	4,326,533
421	4,326,534
631	4,326,535
682	4,326,536
687	4,326,537
702	4,326,538
713	4,326,539
763	4,326,540
766	4,326,541

CLASS 131

280	4,326,542
362	4,326,543
369	4,326,544

CLASS 132

33 R	4,326,545
79 C	4,326,546
89	4,326,547
90	4,326,548
92 R	4,326,549

CLASS 133

2	4,326,550

CLASS 134

8	4,326,893
58 D	4,326,551
99	4,326,552
153	4,326,553

CLASS 137

14	4,326,554
68 R	4,326,555
240	4,326,556
316	4,326,557
554	4,326,558
804	4,326,559
897	4,326,560

CLASS 138

136	4,326,561

CLASS 139

68	4,326,562
76	4,326,563
370.2	4,326,564
435	4,326,565
453	4,326,566

CLASS 141

90	4,326,567
114	4,326,568
383	4,326,569

CLASS 144

34 E	4,326,571
34 R	4,326,570
133 R	4,326,572

CLASS 148

6.14 R	4,326,894
11.5 A	4,326,895
12 D	4,326,896
13.1	4,326,897
16.6	4,326,898
120	4,326,899

CLASS 149

2	4,326,900
12	4,326,901

CLASS 150

0.5	4,326,573
8	4,326,574
50	4,326,575

CLASS 152

356 R	4,326,576

CLASS 156

69	4,327,147
73.1	4,326,902
	4,326,903
85	4,326,904
149	4,326,905
201	4,326,906
212	4,326,907
215	4,326,908
253	4,326,909
540	4,326,910
643	4,326,911

CLASS 160

259	4,326,577

CLASS 162

5	4,326,912
17	4,326,913
105	4,326,914
271	4,326,915
344	4,326,916

CLASS 164

15	4,326,578
461	4,326,579
497	4,326,580

CLASS 165

45	4,326,581
83	4,326,582
183	4,326,583

CLASS 166

82	4,326,584
244 C	4,326,585
285	4,326,586
379	4,326,587
387	4,326,588

CLASS 169

5	4,326,589

CLASS 171

61	4,326,590

CLASS 172

22	4,326,591
123	4,326,592
226	4,326,593
328	4,326,594

CLASS 174

11 R	4,327,242
14 R	4,327,243
15 S	4,327,244
19	4,327,245
36	4,327,246
68.5	4,327,247
107	4,327,248

CLASS 175

9	4,326,595

CLASS 177

178	4,326,596

CLASS 178

3	4,327,249

CLASS 179

1 F	4,327,250
1 N	4,327,252
1 SM	4,327,251
18 FG	4,327,253
84 T	4,327,254
90 K	4,327,255
99 R	4,327,256
115.5 R	4,327,257
175.3 R	4,327,258

CLASS 180

70 MS 4,326,597
304 4,326,598

CLASS 181

175 4,326,599
229 4,326,600

CLASS 182

2 4,326,601
82 4,326,602

CLASS 184

6.1 4,326,603
7 C 4,326,604
15 R 4,326,605

CLASS 187

29 R 4,326,606

CLASS 188

79.5 S 4,326,607
181 T 4,326,608
196 BA 4,326,609
218 A 4,326,610

CLASS 192

0.096 4,326,612
21 4,326,613
70.13 4,326,614
89 B 4,326,611
93 R 4,326,615
111 A 4,326,616
111 B 4,326,617

CLASS 193

17 4,326,618
37 4,326,619

CLASS 194

1 A 4,326,620
100 A 4,326,621

CLASS 198

322 4,326,622
345 4,326,623
370 4,326,624
653 4,326,625
845 4,326,626

CLASS 200

38 A 4,327,259
47 4,326,627
50 C 4,327,260
61.41 4,327,261
148 A 4,327,262
4,327,263
295 4,327,264

CLASS 202

185 R 4,326,923

CLASS 203

6 4,326,924
37 4,326,925
91 4,326,926

CLASS 204

1 T 4,326,927
9 4,326,928
15 4,326,929
20 4,326,930
22 4,326,931
59 R 4,326,932
129.6 4,326,933
180 P 4,326,935
180 R 4,326,934
192 E 4,326,936
198 4,326,937
228 4,326,938
4,326,939
232 4,326,940
268 4,326,941
275 4,326,942
290 F 4,326,943

CLASS 206

158 4,326,628
203 4,326,629
315 R 4,326,630
389 4,326,631
4,326,632
418 4,326,633
626 4,326,634

CLASS 208

8 LE 4,326,945
8 R 4,326,944
93 4,326,946
111 4,326,947
177 4,326,948
263 4,326,949

CLASS 209

3.3 4,326,950
127 R 4,326,951
474 4,326,635
534 4,326,636

CLASS 210

85 4,326,952
168 4,326,953
222 4,326,954
277 4,326,956
436 4,326,957
500.2 4,326,958
515 4,326,959
638 4,326,955
650 4,326,960
683 4,326,961
698 4,326,962
792 4,326,963
793 4,326,964

CLASS 211

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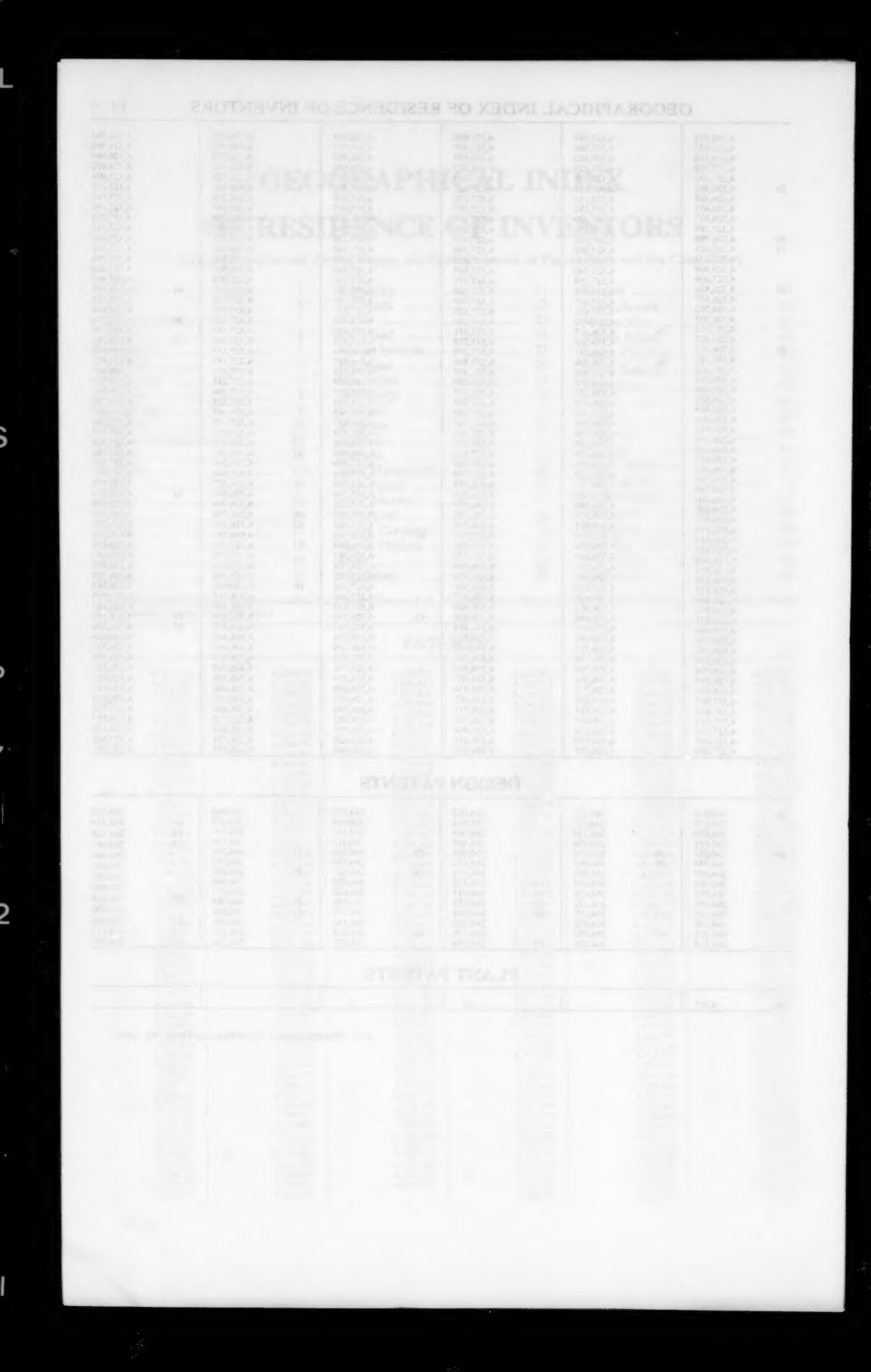

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